THE IRON TRADE REVIEW

Vol. LXIV Cleveland, February 13, 1919 No. 7

Somber View of Market is Overdone

Mill Operating and Booking Conditions Show Improvement in Various Directions—Illinois Steel Co. Breaks Production Record in January—Actual Export Orders Grow and Outlook is More Promising—Iron Market Sluggish

AN unfortunate tendency to overdraw the present stage of the business reaction is manifest in some quarters of the steel industry. Through it indirect support has been lent to some remarkable proposals now receiving consideration in official circles, and also to certain forms of propaganda the good intentions of which are open to question. The immediate situation in the industry is not nearly as bad as painted. While conditions are far from being satisfactory or even comfortable, the better tone in the market first displayed a week ago is having a modest though clearly discernible effect. Export business has broadened further in the week and actual tonnage booked is heavier while promising inquiries are numerous. Domestic tonnage almost wholly in small lots is coming out for quick delivery in a well sustained volume. Specifications against old business are fair. With steel works operations more stationary, the margin between shipments and new business is narrowing. Some large producers now are replacing 75 per cent of their outgoing tonnage.

Price Plan Watched

Whether sharp price reductions in the end will be necessary to stimulate demand is a question yet to be settled. There are no dependable signs that producers are convinced a lower market will be helpful at this time. Some circumstantial reports are current that one large tonnage of structural material and bands was closed in the middle west at sharp concessions. Offsetting this are the unsuccessful efforts made this week by consumers to obtain $2 concessions on large tonnages. The plan proposed by Secretary of Commerce Redfield to formulate some fair basis of selling through interchange of opinions is attracting curious interest. Secretary Redfield insists that his plan does not contemplate the fixing of prices. Government orders in sight include 120,000 tons for new Emergency Fleet ships, 60,000 tons for the remaining portion of the authorized naval program and large tonnages in rails and cars for the railroad administration.

Export Trade Larger

The export situation continues to grow more promising. Large producers in the week received three times the volume of definite inquiry of any week since the armistice and have closed a greater tonnage than in any similar period. Sales have included barbed wire, cold rolled steel, structural and semifinished material. The 20,000 tons of ship steel for Holland has gone to the Steel corporation. Japanese shipyards have specified for a large additional amount in excess of 50,000 tons. That country also is actively seeking important tonnages of rails totalling 50,000 tons. While British mills even at their government-fixed prices can undersell American producers at many points, buyers feel freer to place orders in this country for forward delivery believing further cuts in freight rates will equalize this advantage by the time of shipment. However, the margin is not with the British plants in all markets. American billets at present prices by shipment through the Panama canal now can be laid down in Orient at $69.50 per ton against the British quotation of $72.50.

Chicago at Top Rate

Chicago is proving a bright spot in the steel situation. The Illinois Steel Co. in January produced the largest tonnage of ingots in its history, over 500,000 tons, and operated at full capacity. It continues on that basis. Independent Chicago sheetmakers are receiving sufficient tonnage to maintain 100 per cent operations.

Whatever the betterment in steel, it remains negligible in pig iron. The iron market is extremely backward, sales since the first of the year probably not reaching over 20 to 25 per cent of capacity. Despite the shipments against old orders and the scaling of production, piling of iron is increasing. One estimate places the tonnage at present going to furnace banks at 25 to 30 per cent of output.

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No Chinese Wall Around Britain

SAPIENCE is hardly a characteristic which can be expected of the United States senate as it is now constituted. The lack of this essential mental quality has never been so clearly demonstrated as in the recent outburst regarding the British restrictions on the importation of machine tools, shop equipment and other products. This problem is indeed important enough to justify serious consideration. But it should be examined calmly instead of from the superheated standpoint voiced by Senator Lewis and some of his colleagues.

In the first place, it is inconsistent for a nation with such strongly developed protectionist traditions as the United States to protest against the application of similar policies by another sovereign state. Wisely or otherwise, Britain is simply exercising an indubitable right to protect her manufacturing industries, particularly during the present period of transition.

No objection can be raised to such action on ethical grounds. We can protest only on the basis of injury to our own national interests. On this basis, and on behalf of American machine tool builders and manufacturers of shop equipment generally, THE IRON TRADE REVIEW does protest against too rigid an enforcement of the license restrictions, which would seriously handicap us in the development of our export trade. Therefore, the assurances recently coming from Washington to the effect that Great Britain is willing to modify her plans so as to give adequate protection to her own industries without damaging American interests is gratifying. In any consideration of the present world-trade situation, we would be ungenerous indeed if we did not concede to France and Britain the special right to reconstruct their industries under protected conditions.

A large proportion of the protest against the British government's action is based on a misconception. It has been assumed in the discussions in the senate and in daily newspaper dispatches that the proposed regulations are not only entirely new, but are designed to erect a trade-proof Chinese wall around Great Britain for an indefinite period. Hence the appearance of the term "embargo" in the discussions. As a matter of fact, the proposed arrangement is simply a continuation of the system which has been in operation during most of the war.

There is no ground for the assumption that the proposed plan means an absolute shutout of American equipment. It simply means that the British government is determined to regulate the inflow of this equipment during the transition from war to peace. This control is to be effected, as it has been for the past three years, through a system of import licenses issued under the authority of the British board of trade.

While conceding the strength of the British position with reference to the principles involved, we do believe there is just ground for objection to the method by which it is proposed to control the importation of American machine tools and shop equipment. In other words, as was pointed out in the Jan. 2 issue of THE IRON TRADE REVIEW, page 27, the licensing system is subject to abuses and is at best a source of continuous annoyance. American importers in Great Britain object to the autocratic features of the licensing system. They also point out the inconsistency of permitting their British competitors to pass judgment on their business in this manner, through the fact that British machine tool manufacturers are represented on the import license control committees. As W. L. Hichens, chairman of the great British shipbuilding and steel manufacturing firm of Cammell, Laird & Co., said in a speech quoted on page 381 of the Feb. 6 issue of THE IRON TRADE REVIEW, "No one is entitled to be the final judge in his own cause." It is gratifying, therefore, that the British government has expressed a willingness to leave the settlement of the entire controversy to a specially-appointed mixed commission.

More broadly speaking, the discussion of this whole problem shows how easily a policy of protection pursued entirely selfishly leads to international friction.

Cannot a solution of this fundamental danger be worked out? The League of Nations idea is now generally accepted. Reduced to its simplest elements, it means simply that politically no nation can be a law unto itself. There must be mutual concessions and adjustments. Is not the application of this principle to international economic policies a logical corollary? We think it is.

Slandering Economic Truths

SENATOR LA FOLLETTE'S inclination to willful and pernicious utterances forms a large part of his unenviable record in the United States senate.

His latest attempt to mislead and misrepresent is aimed at the iron and steel industry. In a recent speech on the unemployment situation, he undertook to show that wages had not kept up with the cost of living. He then made the statement:

"Now take pig iron, Mr. President. In bessemer pig iron that costs $12.10 to produce, the labor cost is 73 cents. This is the part that labor plays in the production.

"A ton of pig iron that sold in 1912 for $12.10 had in it as a part of the cost of producing it, 73 cents of labor. The balance was made up of $6.10, cost of iron ore; $3.28 cost of coke; 43 cents cost of limestone; 10 cents cost of steam; 13 cents cost of materials for repairs and maintenance; 12 cents cost of supplies and tools; 24 cents cost of miscellaneous work expense; 18 cents cost of relining and renewals; 3 cents for contingent fund; and 76 cents for general expense and depreciation." (Congressional Record, Page 2052.)

Of course Senator La Follette spoke an economic untruth. The labor costs to produce a ton of bessemer iron is many times the 73 cents he stated. It represents in fact the sum of the labor entering into the mining, transportation and handling of the iron ore to the furnace; of the labor required to mine and transport the coal to the coke plant and to manufacture and deliver the coke to the furnace, and similarly of the labor involved in the providing of the limestone and of every other element or supply entering into production cost. Reduced finally, the cost of a ton of pig iron with the exception of small amounts for amortization of minerals, allowances for plant depreciation, interest on the investment and some other items, is all labor.

Had Senator La Follette stated that the labor cost of the *operation* of converting raw materials into bessemer pig iron, was so much, he would have been reasonably accurate. But there is a world of difference between the labor cost of an *operation* and the labor cost of a *commodity* as the most elementary student of economics knows. Senator La Follette undoubtedly knows this as well as anyone. But he also evidently felt certain his statement would not be challenged.

It is a crying shame that so many of those chosen to high office to represent business as well as all other branches of public interest, feel no compunction either through ignorance, or through willful intent, to speak or allow to be spoken, economic fallacies as half-truths. Perhaps this may serve to explain in a way, the ills to which business is subject perennially in legislative matters. Manifestly the presence of a number of trained and capable business men in congress would be the most effective means of silencing the calumniator as the unthinking of this class.

Capital as an Export Trade Factor

PRICES and bottoms are not the only things which have been checking export business. Money is a most important element in the situation, and the older and more powerful of the nations have strained their credits mightily during the war. The end of hostilities marked the end of reckless spending. Foreign countries are not willing to continue buying heavily abroad, thereby piling up their foreign debt.

Italy today would come into the American market and purchase heavily did she have the means of paying for the goods. But Italy does not have the money, and even did she possess the funds it would not be economical to have her ship gold in payment for iron and steel products bought in the United States. It is no longer a question of quoting prices right and having favorable freight rates. It is no longer a mere question of having the banking facilities to finance the export transaction. But it is a much more fundamental proposition of furnishing the purchaser with the necessary funds. Italy is but typical of conditions practically general throughout Europe. International conditions are fast reverting to the old system of barter and trade. American exporters must accept shipments of lemons or olives in exchange for steel. It is either this or the American merchant must accept foreign securities. This situation is not peculiar to Europe. It is recognizable in South America. Argentine plans extensive reconstruction of her railways, but she must borrow the money to do it. Bonds are about to be floated. They see but two markets for these bonds, the United States and England.

Will Americans be broadminded enough to grasp the significance of this situation? Call loans on the New York exchange carry 5 per cent interest, and loans on the best commercial paper are made at 5¼ per cent. Will the American investor recognize the advantage of risking his money abroad? Money is selfish. It takes not only the higher rate of interest but the safest place of refuge. We have not yet discovered any way of forcing it to go where it will do the most good for the public in general, when selfish inducements are in another direction.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 482

Pig Iron

Bessemer, valley	$32.30
Bessemer, Pittsburgh	33.60
Basic, Pittsburgh	31.40
Basic, valley	30.00
Basic, delivered eastern Pa.	33.90
Basic, Buffalo, furnace	30.00
Malleable, Pittsburgh	32.90
Malleable, Chicago, furnace	31.50
Malleable, Buffalo, furnace	31.50
Malleable, delivered eastern Pa.	35.40

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern	2.25 to 2.75
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 plain eastern	1.75 to 2.25
No. 1X, eastern delivered Phila.	37.90
No. 2, valley, Pittsburgh	32.40
No. 2 foundry, Cleveland furnace	31.00
No. 2 foundry, Ironton furnace	31.00
No. 1 foundry, Chicago furnace	32.25
No. 2 foundry, Chicago furnace	31.00
No. 2X, eastern del., Phila.	36.15
No. 2X, eastern, N. J. tidewater	35.25
No. 2X foundry, Buffalo furnace	32.25
No. 2 plain, del. Philadelphia	34.90
No. 2 plain, N. J. tidewater	34.00
No. 2 southern, Birmingham	32.25
No. 2 southern, Cincinnati	35.85
No. 2 southern, Chicago	37.25
No. 2 southern, Phila.	38.75
No. 2 southern, Cleveland	37.25
No. 2 southern, Boston	40.25
No. 2 southern, St. Louis	39.50
Virginia, No. 2X, furnace	32.25
Virginia, No. 2X, Phila.	36.35
Virginia, No. 2X, Jersey City	36.65
Virginia, No. 2X, Boston	36.95
Gray Forge, valley, Pittsburgh	30.40
Gray Forge, eastern Pa.	33.90
Silveries, 8%, furnace	47.50
Ohio Silveries, 8%, Chicago	50.80
Tennessee Silveries, 8%, Chicago	51.50
Low phos. standard, Phila.	51.00
Low phos. Lebanon, furnace	48.00 to 50.00
Low phos. standard, Pittsburgh	51.40
Charcoal, Superior, Chicago	38.70

Coke

(At the ovens)

Connellsville furnace	$4.00 to 4.50
Connellsville foundry	5.00 to 5.50
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

Ferroalloys

Ferromanganese, 70 per cent delivered	$300.00
Spiegel, 16 per cent fur., spot	57.00 to 60.00
Spiegel, contracts, furnace	nominal
Ferrosilicon, 50 per cent, spot and contract, delivered	125.00 to 135.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer ferrosilicon, 10 per cent	54.00
Bessemer, ferrosilicon, 11 per cent	57.30
Bessemer ferrosilicon, 12 per cent	60.60

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

Open-hearth, Pittsburgh	$43.50
Open-hearth, Philadelphia	47.50
Open-hearth, Youngstown	43.50
Bessemer, Pittsburgh	43.50
Bessemer, Youngstown	43.50
Forging, Pittsburgh	56.00
Forging, Philadelphia	60.00

SHEET BARS

Open-hearth, Pittsburgh	$47.00
Open-hearth, Youngstown	47.00
Bessemer, Pittsburgh	47.00
Bessemer, Youngstown	47.00

SLABS

Pittsburgh and Youngstown	$46.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.00
Grooved skelp, Pittsburgh	2.70c
Sheared skelp, Pittsburgh	3.00c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pitts.	2.80c
Structural shapes, Phila.	3.045c
Structural shapes, N. Y.	3.07c
Structural shapes, Chgo.	3.07c
Tank plates, Chicago	3.27c
Tank plates, Pittsburgh	3.00c
Tank plates, Philadelphia	3.245c
Tank plates, New York	3.27c
Bars, soft steel, Pittsburgh	2.70c
Bars, soft steel, Chicago	2.97c
Bars, soft steel, New York	2.97c
Bars soft steel, Phila.	2.945c
Bar iron, common, Phila.	3.145c
Bar iron, common, Chicago	2.97c
Bar iron, common, Cleveland	3.17c
Bar iron, common, New York	3.17c
Bar iron, common, Pittsburgh	3.50c
Bar iron, refined, Pittsburgh	5.00c
Hard steel bars, Chicago	2.80c

Rails, Track Material

Standard bessemer rails, mill	$55.00
Stand. open-hearth rails, mill	57.00
Relaying rails, light, St. L.	40.00 to 45.00
Angle bars, Pittsburgh base	3.00c
Angle bars, Chicago base	3.00c
Light rails, 25 to 45, mill	2.75c
Spikes, railroad, Pitts.	3.65c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	4.92c
Track spikes, Chicago	3.92c
Tie plates, Chicago	3.00c

Wire Products

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh	3.95
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	3.00
Coated nails per count keg, Pitts.	3.40
Polished staples, Pittsburgh	3.65
Galvanized staples, Pittsburgh	4.35

Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	7.50c
Sheet piling, base, Pitts.	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.25c.

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Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.70c
No. 28, bessemer, Pitts.	4.70c
No. 28, open-hearth, Chi.	4.97c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.70c
No. 28, bessemer, Pitts.	4.70c

GALVANIZED

No. 28, open-hearth, Pitts.	6.05c
No. 28, bessemer, Pitts.	6.05c
No. 28, open-hearth, Chi.	6.32c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.90c
No. 10, bessemer, Pitts.	3.90c
No. 10, open-hearth, Chi.	4.17c
No. 10, open-hearth, Phila.	4.145c

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.35

Iron and Steel Pipe

Base Pittsburgh

Base, Pittsburgh		Black Per cent off	Galv. Per cent off
⅜ to 3 in., butt, steel		54	40½
¼ to 3 in., butt, iron		36	20

Boiler Tubes

Steel, 3½ to 4½ inches, l. c. l.	33
Iron, 3½ to 4½ inches, c. l.	12½

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $1 higher than Class B.

Four-inch, Chicago	$64.80
Six-inch and over, Chicago	61.80
Four-inch, New York	65.70
Six-inch and over, N. Y.	62.70
Four-inch, Birmingham	58.00
Six-inch and over, Birmingham	55.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.30c
Bands, Pittsburgh	3.30c
Hot rolled strip steel, Pitts. stamping quality	3.30c
Shafting, Pitts., carloads	21 off to list
Cotton ties, per bundle	nominal

Rivets

Structural rivets, Pittsburgh	4.20c to 4.40c
Boiler rivets, Pittsburgh	4.30c to 4.50c

Rivets ⅞ in. and smaller Pittsburgh, 50-10 off to 50-10-10 off.

Nuts and Bolts

(Prices f. o. b. Pittsburgh)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	50-5 off
Cut thread	40-10-5 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50-10-5 off
Cut thread	50-5 off
Larger and longer	40-10 off
Cold pressed semifinished hexagon nuts ⅜ in. and larger	60-10-10 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	70-5 off
Gimlet and cone point lag screws	50-10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Quotations on leading products February 12, average for January, 1919, average for November, 1918, and average for February, 1918. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Feb. 12, 1919	Average prices Jan., 1919	Nov., 1918	Feb., 1918
Bessemer, valley del., Pittsburgh	$33.60	$33.60	$36.60	$37.25
Basic, valley del., Pittsburgh	31.40	31.40	34.40	33.95
*No. 2 Foundry, Pittsburgh	32.40	32.40	35.40	33.95
*No. 2 Foundry, Chicago, furnace	31.00	31.00	34.00	33.00
Lake Superior charcoal, Chicago	38.70	38.70	38.70	37.50
Malleable, valley	31.50	31.50	34.50	33.50
Malleable, Chicago	31.50	31.50	34.50	33.50
**Southern, No. 2, Birmingham	32.25	32.25	35.25	33.50
*Southern Ohio, No. 2, Ironton	31.00	31.00	34.00	33.00
Basic, eastern del., eastern Pa.	33.90	33.90	36.90	33.00
**No. 2X Virginia, furnace	32.25	35.25	38.00	33.50
**No. 2X, eastern del., Philadelphia	36.15	36.15	39.15	34.25
Ferromanganese, 70%, delivered	200.00	217.00	250.00	250.00
Bessemer billets, Pittsburgh	43.50	43.50	47.50	47.50
Bessemer sheet bars, Pittsburgh	47.00	47.00	51.00	51.00
Open-hearth sheet bars, Pittsburgh	47.00	47.00	51.00	51.00
Open-hearth billets, Pittsburgh	43.50	43.50	47.50	47.50
Steel bars, Pittsburgh	2.70	2.70	2.90	2.90
Steel bars, Chicago	2.97	2.97	3.17	2.90
Iron bars, Philadelphia	3.145	3.745	3.74	3.50

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Prices Feb. 12, 1919	Average prices Jan., 1919	Nov., 1918	Feb. 1918
Iron bars, Cleveland	$3.25	3.33	3.64	3.64
Iron bars, Chicago mill	2.97	3.13	3.50	3.50
Beams, Chicago	3.07	3.07	3.27	3.00
Beams, Pittsburgh	2.80	2.80	3.00	3.00
Beams, Philadelphia	3.045	3.045	3.24	3.185
Tank plates, Pittsburgh	3.00	3.00	3.25	3.25
Tank plates, Chicago	3.27	3.27	3.52	3.25
Tank plates, Philadelphia	3.245	3.245	3.49	3.435
Sheets, blk., No. 28, Pittsburgh	4.70	4.70	5.00	5.00
Sheets, blue anld., No. 10, Pittsburgh	3.90	3.90	4.25	4.25
Sheets, galv., No. 28, Pittsburgh	6.05	6.05	6.25	6.25
Wire nails, Pittsburgh	3.50	3.50	3.50	3.50
Connellsville furnace coke	4.50	5.90	6.00	6.00
Connellsville foundry coke	5.50	20.80	28.75	30.00
Heavy melting steel, Pittsburgh	17.00	7.00	7.00	7.00
Heavy melting steel, eastern Pa.	15.50	19.00	28.00	30.00
Heavy melting steel, Chicago	15.50	19.20	29.00	30.00
No. 1 wrought, eastern Pa.	25.00	29.80	34.00	35.00
No. 1 wrought, Chicago	21.50	23.30	33.00	35.00
Rerolling rails, Chicago	19.50	22.30	34.00	35.00

(FOR ADDITIONAL PRICES SEE PAGE 482)

Eastern Pig Iron Demand Better

More Domestic Business Closed and Livelier Export Market Develops One 4000-Ton Sale—Conditions Stagnant in Other Districts However—Virginia Iron is Established—Basic Resold at Pittsburgh at Concession

New York, Feb. 10.—In view of the consistent disposition of export buyers to postpone action, it is with considerable satisfaction that one export sale of 4000 tons has been announced by a large seller. No details are given excepting that the sale was made to a customer who before the signing of the armistice had been buying good sized tonnages from this seller. Other export sales during the past week involved something less than 1000 tons of foundry in the aggregate. In general pig iron sellers are more encouraged as a result of an improvement in the demand during the past week. In the domestic angle of the market there is more inquiry and sales have been more numerous. The tonnage involved, however, still is small from a comparative standpoint, since consumers now are willing to buy only what they actually need for spot or nearby consumption. Foreign inquiries are active, but in most cases, outside of those mentioned, there continues an indisposition to buy. Among current inquiries are one for 3000 tons of low-phosphorus for China and a number for moderate tonnages of foundry and round lots of basic and bessemer. One of the eastern Pennsylvania furnaces during the past week has made some small sales of 2 plain foundry in 1.75 to 2.25 silicon on the basis of $32.50 at the furnace, for domestic consumption. This maker, which as a rule uses up its own output and sells only on occasions, is the first eastern interest to depart from the custom of quoting on the basis of Pittsburgh. Although this furnace probably will continue willing to book tonnage for delivery over the next few months, its total output is not regarded as an important factor in the market. It is of interest to note that $32.50 at this furnace represents concessions of $1.50 to $2.00 per ton on 2 plain iron, delivered at Newark, Jersey City and New York, as compared with prices representing delivery at these points or a Pittsburgh base.

Not Much Going on

Pittsburgh, Feb. 11.—Beyond the small tonnages needed to piece out, consumers of pig iron are showing almost no interest in the market here. With producers equally indifferent about making sales, a quieter market than exists is hard to imagine. But below the surface, and unaccompanied by widespread publicity, a good many small lots are being moved. These include basic, bessemer and foundry grades and direct sales from the furnaces have been done on the prices established as of Jan. 1. Some resale basic iron is coming on the market and two or three lots involving a couple thousand tons have been sold on a basis of $29.50 f.o.b. valley furnace. This iron was offered by a steel company which by virtue of cancellation of much government work, found itself oversupplied with iron and now is offering that portion of the over-purchases which the makers refused to cancel. It is barely possible that some of this iron may be bought for an even lower price than $29.50 for the reason that the company in question merely will charge up the difference between what it paid and what it obtained for this iron to the government, since the iron was originally ordered in connection with government contracts. As a general rule, producers are holding fast to the lower prices established at the beginning of the year and in view of the fact that current inquiry is not especially large and that not a few melters are seeking deferred shipments, the market must be said to be firm. Apparently merchant producers are satisfied to stock the iron that has been sold but which has not been ordered out, and evidently believe that a reduction in prices now would not help sales. In the maintenance of prices they are having the assistance of the steel manufacturers, not a few of whom have surplus iron, but are not offering it for less than the going market quotations. The merchant blast furnace interests who recently restored the straight-time schedule at

their plants report no trouble as a result of the new working arrangement. All merchant producers, however, have not attempted this change, preferring to wait until such action is taken by the big steel companies.

Inquiry Better, Sales Few

Buffalo, Feb. 11.—There seems to be a good deal of inquiry for pig iron coming to producers of this district, but in the aggregate it develops an infinitesimal amount of business. It undoubtedly is being put out to feel out the market, buyers probably being of the opinion that a drop in prices may ensue. Nothing of the sort has developed. On the contrary there is every disposition on the part of makers to shut down furnaces rather than to attempt to stimulate demand by concessions. Furnaces here won't stock iron—that sentiment seems to be pretty generally reflected by producing interests. Two stacks of a large producing interest are down for relining and though others have business which should take them well along into the first half, representatives say that the plants will be put out should business grow worse. One well informed furnace man here says that he does not look for a return to conditions approaching normal until 1920. The fact that a furnace at Charlotte, N. Y., has a freight advantage in quoting on iron going to tidewater is not causing much interest locally, and probably will not, unless this maker begins quoting iron delivered, instead of as now—at furnace.

Chicago Market Quiet

Chicago, Feb. 11.—Applying itself to the task of readjusting from war to peace production the pig iron consuming industry is not interested now in this material. Buying during 1918 for delivery during first half of this year was done under circumstances which have provided sufficient supply and in some cases an excess. Under these circumstances the date for beginning buying for last half is likely to be delayed until consumers can determine how much tonnage they will have left over at the middle of the year. Some brokers are finding opportunity to dispose of a few carloads daily, the tonnage sometimes running to 300 or 400 tons per week. This is made up of high sulphur iron, resale iron and other irregular varieties which are taken on by the melter who needs a small quantity to temper his mixtures. There is practically no inquiry except in isolated instances and usually for specialties. One inquiry is current at present for 200 tons of bessemer iron for a user in this district.

Smooth Out Controversies

Cincinnati, Feb. 10.—Furnace representatives are not trying to force the market and seem to be devoting their time principally to settling of disputes that have arisen as to the billing price on iron now shipped that was ordered before government regulation ceased. Some headway has been made by a few furnaces in smoothing out such difficulties by invoicing the metal at a base price of $31, furnace, instead of $34. Not all southern furnace operators have joined in on the proposition, but it is understood that generally speaking, buyers have about convinced producers that the question at lease deserves serious consideration. Many contracts were made on iron for forward shipment containing a proviso that the last government price was to rule and it is hardly likely that these will be changed. An inquiry for any tonnage of iron would be received with surprise. So far resale iron has not been much of a factor to be considered in this market.

Few Sales at St. Louis

St. Louis, Feb. 8.—Actual sales of pig iron this week have totaled less than 1000 tons, including all grades. Inquiries are scarce and apply to small tonnages. The disposition of consumers to wait has not been changed. Melters who really need iron are unwilling to enter the market, even at the $3 reduction in base price. The belief prevails that further concessions will be forthcoming, due to the fact that producers are beginning to show accumulations and are anxious to keep intact their facilities for the expected revival later in the year. It is notable, however, that the furnace interests, both in the East and South, are not willing to sacrifice themselves or their customers with more expensive iron, and from what can be gathered here, there will be no further price reductions in the near future. Deliveries on old contracts are being made promptly, and save in a few rare cases tonnages are being readily accepted and apparently worked off. According to best posted factors in the trade here the situation depends on two issues, the peace conference and adjustment by the government of outstanding war contracts. The iron and steel industry is not willing to beat its sword into a plowshare, they say, until it is fully established that the sword will be no longer needed. As to the other point, the major industries have millions of wealth tied up in war contracts, and until their claims are settled this money will not be available for routine commercial affairs. During the week several more of the southern furnaces have announced a reduction to the $31 base, while others still adhering to the old government price outwardly, have let it be known that they will talk business at the lower rate. There are more reports of southern stacks going out of blast, some for repairs and others because of inability to weather the competition and lack of orders. It is understood that the leading producer in this district will close down for relining purposes.

Alabama Business at Low Ebb

Birmingham, Ala., Feb. 11.—Southern furnace companies are doing practically nothing, save filling old contracts, which do not require the full output. Production of pig iron is as low as it has been at any time in some years. Alabama production in January was under 181,000 tons, the lowest month's output in several years, and there will be no improvement this month. Some accumulation of iron at furnaces is still noticeable. With but one or two exceptions, furnace companies in the Birmingham district are offering No. 2 foundry at $31. Two small furnaces resumed operation in this district recently, while fires were relighted in two others. One of the Ensley furnaces of the Tennessee Coal, Iron & Railroad Co. was damaged by accident, and will be out some time until repairs can be made.

Export Inquiries Appear

Cleveland, Feb. 11.—New bookings in pig iron by the furnaces in this district remain of such scant proportions as to be practically negligible. One large interest in a week entered a total of 500 tons of foundry iron for first and second quarter delivery. Domestic inquiry is exceedingly light but there has been more activity in the way of requests for iron for export. A leading New York house has asked for 3000 tons of low phosphorus and 3000 tons of No. 1 foundry for early delivery to China. Another export inquiry involves 2000 tons of basic upon which the destination is not given. A Japanese inquiry for 1000 tons of bessemer and 1000 tons foundry still is pending. Furnaces in this district continue to maintain an unchanged rate of production but are piling considerable iron and the rate appears to be increasing. Consumers are taking out their iron ore on contract only in a fair fashion and some extensions are being granted. Prices seem to be very firmly held and there are no reports of concessions.

Virginia Iron is Established

Philadelphia, Feb. 11.—Virginia foundry iron now is established at $31, furnace, for No. 2 plain or 1.75 to 2.25 per cent silicon, at $32.25 for No. 2X or 2.25 to 2.75 silicon, and at $34 for No. IX or 2.75 silicon and up. One sale of 500 tons and several smaller lots have been sold at these prices. At the established level Virginia iron now is only 20 cents higher at Philadelphia than eastern Pennsylvania iron at that point when quoted on a Pittsburgh basis. Rumors which have been in circulation that standard eastern Pennsylvania brands have been sold as low as $31, furnace, for No. 2 plain, proved to have no foundation. The situation was carefully checked over at the meeting of the eastern and Virginia pig iron associations in this city last week. This canvass developed that all eastern Pennsylvania furnaces are adhering to the $31, Pittsburgh, base schedule except in connection with one export negotiation where the foundry price was shaded by over $1.50. The only case where the Pittsburgh base has been shaded on eastern business was in a sale of a car of No. 2 plain at $31, Juniata furnace, to a consumer in the Philadelphia district whose plant takes a $2.80 freight. Later in the week a Lehigh valley furnace which occasionally sells in the market offered a limited tonnage of iron at $32.50 for No. 2 plain, and at $36, furnace, for No. 2X, equivalent to $33.60 and $34.10, respectively, delivered, Philadelphia. Sales of foundry iron in this district the past week have totaled approximately 2000 tons. This included one single transaction involving 300 tons for second half delivery to a nearby buyer. It is learned that the $3 reduction in price has been applied to practically all basic contracts in the east. One basic

inquiry for several thousand tons which came up several weeks ago has been dropped. The only transaction in low phosphorus iron of the past week was 400 tons to Pittsburgh consumers. Export inquiries include 5000 tons of low phosphorus iron for China, several thousand tons of basic, 6000 tons of bessemer and considerable foundry but the signs do not indicate that these will be closed immediately.

Prompt Demand

For Wire Products Continues of Fair Total—Buying Fence Freely

Pittsburgh, Feb. 11.—Orders for wire and wire products still are small but fairly numerous and in the aggregate make a fair sized total. These orders in all cases call for prompt shipment, although sellers have had plenty of opportunity to book long-time contracts if they would guarantee buyers against a cut in prices. This however, they refused to do as it is declared that current prices, especially of nails, show only a moderate profit. Not much is doing in barbed wire at the moment, although there are occasional orders. Specifications from the manufacturing trade are fairly free and the mills would be quite fully engaged if jobbers were ordering as freely as are those who manufacture wire further. Export inquiries are reported good and a few fair sized orders for nails have been placed with Pittsburgh district manufacturers. While export premiums on most lines of finished steel over domestic levels have been largely wiped out, wire products for export still command considerably higher prices than domestic buyers are being called upon to pay. Not much Canadian business has lately come to manufacturers here, in explanation is a report that the war import tax of 7½ per cent on steel products from the states may be removed soon and buyers naturally are postponing purchases until this eventuates. Indications are that American manufacturers of barbed wire for agricultural purposes are going to have some trouble getting much business in the Canadian northwest. It is reported that freight rates on barbed wire from Hamilton and Montreal to the northwestern portion of Canada, have been materially reduced.

January Sales Improving

New York, Feb. 10.—The sale of wire products during January involved approximately 10 per cent more tonnage than in December. Incidentally new bookings, according to one large maker, were at the rate of approximately 75 per cent of shipments during January, which were in heavy volume.

Buying Fence Freely

Cleveland, Feb. 11.—Buying of fabricated fence by the dealers and jobbers is going forward quite freely and the season for this trade which is now under way has made a fair showing to date. Otherwise the wire situation is little changed. Mill production in this district is being maintained with little variation by a continued flow of small orders aggregating a fair total. Manufacturing wire is moving well for early shipment.

Coke Supply Exceeds Need

Easier Prices for Quick Shipment Accordingly Continue—Connellsville Furnace Fuel at $4.00 to $4.50 Ovens—By-Product Lower

Pittsburgh, Feb. 11.—Although there has been extensive blowing out of beehive coke ovens and a consequent decline in production, there has been an even greater decline in consumption and spot supplies still are quite ample for wants. With hardly a consumer lacking in supplies, and not a few of them oversupplied, current demands are extremely limited. In fact, much trouble is being experienced in getting buyers to accept full shipments and suspensions are being made so freely as to throw back on the hands of producers large tonnages. Illustrative of the current situation with regard to shipments on contracts, a case is cited of a Connellsville producer whose normal daily shipments are about 50 cars, and who one day last week had instructions only on one car. This probably is an extreme case, but at the same time all producers are getting hold up orders and since they do not get such orders in tim eto adjust production accordingly and the tonnages held up have to seek the open market. On coke on the ground or on cars, producers are obliged to accept buyers' valuations and at present buyers who will take on supplies have fixed $4 as their idea of the value of standard furnace coke, and $5 as a fair price for standard foundry fuel. As much as $1 a ton over these prices is being asked by producers, but the latter are finding it one thing to ask, but a vastly different one to obtain what they ask. So little business is going on in either furnace or foundry coke that actual selling prices are not easily determined, but $4 to $4.50 for furnace and $5 to $5.50 for foundry seem to be about as near as the present market can be quoted on spot supplies. It is purely a buyers' market for the surplus supplies which are on the hands of producers. No definite action has been taken with regard to first half contracts stipulating the last government prices as the basis of settlement, but since buyers hold the whip-hand through their privilege of holding up shipments in part or in whole, it is becoming a pretty general belief that such agreements will be revised as to prices that will insure fulfillment of obligations on the part of users. The contracts probably will be adjusted individually and then only upon request. According to *The Connellsville Courier* production of coke in the Connellsville region for the week ended Feb. 1, was 262,644 tons, compared with 277,324 tons in the previous week.

Lower By-product Prices

Chicago, Feb. 11.—Manufacturers of by-product coke in the Chicago district have named $9.90 per ton, f.o.b. Chicago, for foundry coke and $9.40 per ton, f.o.b. Chicago, on crushed coke. This is the first price named under a free market and is about 50 cents per ton under the former quotations, which were based on Connellsville prices, plus freight to Chicago. The new price applies on all coke delivered on new or old contracts, producers giving their regular customers the benefit of a reduction even though contracts called for a higher price.

Prices Are Uncertain

Cincinnati, Feb. 10.—Some uncertainty exists as to what prompt coke is worth in different fields. Prices have been shaded by a number of producing interests and furnace coke will not bring over $5 per net ton, ovens, and even this figure has been cut 50c a ton. Foundry coke is around $6 to $6.25, and it is rumored that some off fuel only brought $5.75. However, the amount sold was very small. Pocahontas, Wise County and New River prices are very much unsettled and today no general quotable average can be had from any source.

Little Demand in St. Louis District

St. Louis, Feb. 8.—Demand for coke of all descriptions is extremely lax in this district. Melters have all they need piled or under contract, and inquiry for foundry grades the past week was about the quietest in three years. The small tonnages moving in the Southwest are being bought from southern producers, the railroad rates favoring the Birmingham makers. When the war was on, southwestern melters as far away as the Rio Grande, were beseeching this territory for supplies, but now this business has vanished. The mild winter also has hurt the industry. Selling agencies say the iron and steel business will have to do a whole lot better before there can be much of a revival in the demand for foundry coke. Some concessions in prices are reported, but a number of the largest interests still are quoting the old figures. The principal by-product interest continues to produce at capacity, and has some surplus to sell. Coal is plentiful and moving regularly. Surplus stocks of soft coal are enormous.

Coke Holding Its Own

Birmingham, Ala., Feb. 11.—Coke is holding its own in the Birmingham district. No curtailment in production has been permitted and demand is holding strong. If there have been any changes in quotations they have not been made public. Coal production in Alabama is beginning to lag. Wagon mines, which haul their coal to the railroads or sell on the local market, are beginning to shut down. Producers of domestic coal have increased their prices, ranging up to 50 cents a ton, since the government released control of the market.

One of the two furnaces of Joseph Thropp at Everett and Saxton, Pa., continues out of blast, due to relining, but it is expected to resume shortly.

Scrap Decline is Renewed

Pause in Downward Trend Proves to be Only Temporary—Some Districts, However, Show More Stationary Condition

FOR COMPLETE SCRAP PRICES SEE PAGE 482

Chicago, Feb. 11.—The bottom for scrap prices seems farther down than had been expected and recent pauses in the downward course of quotations have not resulted in a full stop. On the contrary almost every grade has been reduced further and the present level is far below the starting point. Comparatively little buying is taking place, and the market is quiet in almost every department. In spite of the comparatively small tonnage being moved, no accumulation is becoming evident and a revival of buying seems likely to produce a shortage which probably would result in quotations being advanced sharply. Some consumers are taking bargains steadily as the market declines, evidently believing that their costs will average well when the bottom is reached. The Northern Pacific offers 1700 tons, the Wabash 1400 tons, the Chicago, Milwaukee & St. Paul 1200 tons and the Chicago Great Western 500 tons.

Steel Goes to $11

New York, Feb. 10.—Prices in the local iron and steel scrap market continue to decline. Heavy melting steel has been sold here as low as $11, f.o.b. New York, and further heavy reductions have been made on wrought and cast material, although the figures can be regarded only as nominal. Among the few descriptions to remain fairly steady are clean cast borings, which are holding at $10, and stove and grate bars, which are and have been quoted for several weeks at around $16 to $17, f.o.b. New York. At present there is little probability of demand developing any time in the near future. Sellers generally have long since reconciled themselves to some weeks of inactivity.

Eastern Market Sluggish

Philadelphia, Feb. 11.—Scrap demand as gaged by market transactions continues to be limited to small lots. Sales of rerolling rails the past week have established the market at $17 to $18, delivered, and old car wheels now are from $22 to $24, delivered, based on actual transactions. No. 1 yard wrought has declined to $19 to $20, delivered, heavy milling steel is unchanged at $15 to $16, delivered, low phosphorus is nominal at $20, delivered, for crop ends and guaranteed material, and at $16, delivered, for unguaranteed.

Prices Still Are Settling

Pittsburgh, Feb. 11.—Scrap iron and steel prices still are inclined downward in this market, with hardly enough business actually being done upon which to base quotations. During the past week, a Pittsburgh district steel manufacturer took 1000 tons of heavy melting steel at $17, delivered and another steel company has been a free taker of machine turning that it could buy at its price of around $9 a ton delivered. This latter company also bought a tonnage of cast borings at $12.50. This constitutes the week's transactions. The general attitude of consumers still is one of indifference toward the market and it is difficult to interest them to the extent of making a bid. When they make an offer, it is so far under what are recognized as market values as to suggest that they do not want the supplies. Production of scrap is running away from consumption and so long as this condition lasts there is little chance for the market to develop much stability or steadiness. It was thought some time ago that $18 would mark rock bottom on heavy melting steel, but having broken through that figure its probable resting place now is placed much lower. Much talk is heard of the growing spread between scrap and new steel prices, but this comes chiefly from the scrap trade. Consumers contend that scrap is a by-product; that it involves only a trifling plant investment since only 10 to 15 per cent of the total supply is handled through yards and that since the cost of producing it, is out of it long before it reaches commercial channels, it is not to be figured with finished steel. Prices of scrap, it is stated, are determined entirely by supply and demand and that present prices are the result of the fact that supplies exceed the demand. Scrap dealers are losing money pretty regularly these days, for they are flooded with offerings from regular sources and since prompt removal is insisted on by producers and consumers, the turnover is possible only at low prices.

Prices Are Stationary

Buffalo, Feb. 11.—With district mills operating on 50 per cent of capacity and even less, the demand for scrap remains at a low point here. Prices have remained at the same levels for two weeks now and dealers think the bottom has been reached. Stock piles are diminishing and dealers are hopeful that if the mills can continue on their present percentage of operations, scrap holdings will be so cut as to force them into the market for material to carry out existing contracts. Mills are using scrap very freely now. During the week a few small sales were recorded, but mostly to consumers outside this district. Dealers do not regard the greater degree of activity as indicating a buying movement of any consequence. It is looked upon generally as passing development.

Decline Comes to Halt

Cleveland, Feb. 11.—Scrap iron and steel prices, which have been moving steadily downward, have come to a halt. While some dealers believe prices will go up before they again go down, a great many more sellers do not expect until late next month, the start of the buying movement long looked for. If the latter view is correct, lower prices would seem to be inevitable, for the market is not likely to remain stationary. Heavy melting steel now can be had for $14.50, delivered, just half the last government fixed price. This prompts dealers to scoff at the old belief that a certain established relation exists between pig iron and finished material on one hand and scrap on the other. Last government scrap prices now are halved, dealers point out. They point to steel, which has dropped from $29 to $14.50, and turnings, formerly $19 and now $7.75, while pig iron has dropped only $3 a ton and finished material even less, on the whole. The scrap now changing hands is limited to carload lots. Producers, compelled by the lack of storage space to throw their scrap upon the market, are providing some choice bargains for yard men. Most of this material is being stacked. Opposition to a return of government price fixing is unanimous.

Decline Still Goes On

Cincinnati, Feb. 10.—It was said last week that scrap had about reached the bottom, but this prediction has not come true. Prices are still tumbling and just now this is strictly a buyers' market. The only trouble is there are no buyers to absorb such offerings as are made. Both the foundries and the steel mills have more scrap than they can take care of. The railroads have some scrap ready to market but are unable to get anything like satisfactory bids

Further Reductions at St. Louis

St. Louis, Feb. 8.—Further heavy price reductions featured the market for scrap iron and steel here this week. Heavy melting steel touched $16 and practically every item in the list was marked down. The end of the decline is not yet in sight. Weakness in the East and elsewhere is having a depressing effect and in addition there is absolutely no demand from any quarter. Consumers are not purchasing a pound of any grade and declare they have all they will require for a long time. The three largest purchasers, the National Enameling & Stamping Co., the American Car & Foundry Co., and the Helmbacher Forge & Rolling Mills Co. have announced they are out of the market. Buyers and sellers are of the opinion that the scrap situation will not improve until activities in general lines get well under way. One depressing factor in the scrap market is the plentiful supply of pig iron. Numerous plants in this region, which for months substituted heavily with scrap on their pig requirements, are now getting all the pig iron they can use.

Small Demand

Shown in All Alloys—Actual Prices Are Very Uncertain

New York, Feb. 10.—Among inquiries for ferromanganese during the past week, the only one of importance called for 500 tons for Italy. Sellers do not expect this busin ss to be placed here, and believe the tonnage

will go to an English producer. Other inquiries were small and did not result in any business. Numerous lots of ferromanganese continue to be talked of for resale, but it is found on investigation in many cases that the prospective sellers are not so anxious to dispose of the material as to ascertain its value in order to make claims upon the government in connection with cancelled contracts. As the market continues practically devoid of business, it is impossible to quote it accurately. Alhough the price of 70 per cent ferromanganese may be quoted nominally at $200, most producers continue to adhere to the $225 figure. However, there is not much temptation at the present time to quote any lower.

In spiegeleisen there continues an almost entire absence of demand and the situation largely is nominal. Spiegeleisen may be quoted at around $57 to $60, delivered, for 16 per cent metal.

Business at a Standstill

Pittsburgh, Feb. 11.—Conditions in the market here for ferroalloys have not changed more materially than those that have existed for the past few weeks. There is not a consumer in this district who has not enough material to carry him over the first half at least and most of them have contracted for considerably in excess of their probable needs. To interest them under the circumstances is almost an impossibility; in fact, consumers now are the sellers rather than the producres of the various kinds of ferroalloys. Resale business forms the bulk of current dealings and the basis of such transactions is determined largely by the conditions surrounding the sales. Such business is going on in all instances very much below the quotations named by the producers. A quotation of $200 a ton, delivered, on 70 per cent ferromanganese is merely a quotation and has no basis in sales. Buyers' ideas of the value of this alloy are nearer $150, and it is probable that such wants as they must cover can be had at approximately that price. For 50 per cent ferrosilicon, the market is settled at about $115 a ton, delivered, with resale lots constituting most of the transfers. So little is going on in spiegeleisen or fluorspar that it is extremely difficult to arrive at any definite idea as to their price.

Marshall Foundry Sold

Pittsburgh, Feb. 11.—Negotiations, which have been in progress for several weeks, whereby control of the Marshall Foundry Co., Pittsburgh, passes to the Valley Mould & Iron Corp., Sharpsville, Pa., were concluded at a meeting held at the offices of the Marshall Foundry Co. here today. The entire property of the Marshall company goes to the Valley Mould & Iron Corp.

Bar Iron Lower

New York, Feb. 12.—Chicago mills are offering bar iron in the east at 2.90c, Pittsburgh, or 3.145c, Philadelphia, and 3.17c, New York, but no business has been done.

Shape Projects Increase

More Figuring is Reported in Nearly All Territories—Orders, However, Are Very Few—Hanna Memorial Up at Cleveland

New York, Feb. 10.—Structural projects in the East appear somewhat more numerous, but the aggregate tonnage involved remains small. The largest inquiry to come during the past week involves 800 tons for a pier for the city of Philadelphia. Other inquiries include 500 tons for a railroad bridge at Lawrence, N. J.; 300 tons for a storage building at the Boston navy yard; 300 tons for the state barge canal terminal at Brooklyn, and 250 tons for an office building in Washington for the International Association of Machinists. New bids have not as yet been asked on the 16,000 tons required for additional elevated railroad construction in New York City, but this is expected shortly. Several additional projects are being closely watched at this time; however, none so far has progressed to the extent that bids are desired. One of the largest of these projects is a $1,500,000 office building, to be erected on Wall street. Plans are being drawn by Charles E. Birge, 29 West Thirty-ninth street. The price situation remains practically unchanged. Plates are being quoted by the eastern mills generally at 3c, Pittsburgh, with a few still holding to the 3.25c, Pittsburgh, price. The market on plain shapes is still 2.80c, Pittsburgh.

Many Seek Eastern Job

Philadelphia, Feb. 11.—How urgent is the desire for work on the part of structural interests is reflected by the fact that no less than 65 contractors have been bidding for the construction of the Kenilworth pier, tenders for which have been taken by the city of Philadelphia. This contract covers several thousand tons of steel and is the only important structural job in sight. New shape business continues to run light but most of the eastern mills are in a comfortable possession on old bookings.

Small Orders Are Numerous

Pittsburgh, Feb. 11.—A great many small orders are coming to the shape mills in this district and are helping, to some extent, to offset the loss of completed tonnage. Although fabricating mills are not so well off in the matter of business as are some of the other finishing plants, there seems to be a fairly optimistic feeling in the trade. Suggestions of the construction of a new hotel and several schools in New York give rise to hopes of early orders of structural material. Two bridges are planned to span the Allegheny river at Pittsburgh, at Sixteenth and Fortieth streets, and while the actual construction of these bridges is several months away, there is little doubt but that they will go through, and each would take, it is estimated, about 3000 tons, owing to the length of the span at the proposed bridge sites. The Kelly-Springfield Tire Co. has been making frequent inquiries recently in connection with its new plant at Cumberland, Md., which was held up by the war. Buyers generally are disposed to hold off in the expectation that prices will be lower, but thus far there has been no easing in the market; in fact, an offer of $2 a ton under the market on a very desirable tonnage of structural material, recently was refused. The Pennsylvania railroad lines west recently ordered a small bridge involving 100 tons of material to McClintic-Marshall Co. This company also took an order for a 50-foot pony span for export from the United States of Columbia. There have been no other structural awards of any account but plenty of small jobs have been coming in, the leading interest reporting the past week as having been the best in a long time with regard to a number of small orders that have been booked.

More Jobs Are Current

Cleveland, Feb. 11.—A little improvement is shown by the amount of new structural work being offered or more definitely in prospect. In this district an engineering company is asking for 400 tons on a specific job while at Toledo figures were submitted this week on a 300-ton undertaking. It is estimated that the new office building which Dan R. Hanna will erect in this city as a memorial to his father, the late Senator Marcus A. Hanna, will require from 4000 to 5000 tons. Architects now are drawing plans for this structure and bids are expected to be taken soon. Other office building projects are maturing. Extra efforts made by large buyers of structural shapes to obtain concessions have failed and the market remains firm at 2.80c, Pittsburgh.

Demand Slow to Return

Chicago, Feb. 11.—Demand for structural steel continues to be almost negligible and no projects involving more than a few tons have been closed in the West recently. Activity leading to placing about 8000 tons for the Michigan boulevard bridge at Chicago promises to result in this steel being ordered within a short time, as the improvement is to be undertaken immediately. A number of other prospective tonnages are being considered but have not yet yielded actual orders.

CONTRACTS AWARDED

New electrically operated coal bridge for Callaway Fuel Co., Milwaukee, 85 tons to Lakeside Bridge & Steel Co., Milwaukee.

CONTRACTS PENDING

Office building for International Association of Machinists, Washington, 250 tons, bids being asked.

Storage building for Boston navy yard; 300 tons, bids being asked.

New York state barge canal terminal, Brooklyn; 300 tons, bids being asked.

Pier for city of Philadelphia, 800 tons; bids being asked.

Pennsylvania railroad bridge at Lawrence, N. J., 500 tons, bids being asked.

Bar Inquiry is Heavier

Chicago Mills in Comfortable Position and Pittsburgh Orders Better —Sharp Concessions on Material Rolled from Shell Steel

Pittsburgh, Feb. 11.—Makers of merchant steel bars in this district report inquiries as more frequent than they were a short time ago and they are booking a fair number of prompt shipment orders which, though small individually, reach a fair sized aggregate. Prices are firmly maintained on a basis of 2.70c, Pittsburgh, notwithstanding that in the west, soft steel bars are finding rather strong competition from bars made from shell steel billets. The latter are reported to have sold at $30 and $35 per ton and even lower and at that price can be rolled into bars and sold at substantial profit well under the 2.70c Pittsburgh basis. Makers of iron bars still are holding out for 3.50c, Pittsburgh, for common merchant iron but are not doing much business. Buyers seem more or less impressed by the fact that prices here are out of line with those in the Chicago territory and furthermore seem to be well covered against their immediate requirements. A fair amount of old business still is before the makers of iron bars. Demand for concrete reinforcing bars is extremely limited and is not expected to improve materially until some of the construction projects, now under consideration, actually get under way.

Rerolled Material Offered Lower

Cleveland, Feb. 11.—Bars and small shapes rerolled from shell steel blooms and billets are being offered at considerable concessions by parties who have arranged for the conversion of this material. The competition of these products with soft steel bars is limited, however, and there are reports current that some of those engaged in converting this stock have been meeting with some difficulty in their operations. A local jobber has made an arrangement for conversion of this kind and has been offering this material in the open market. Rerolled bars have been offered in considerable quantity at from 2.25c to 2.50c, mill, or sharply under the regular market level of 2.70c, mill. There are reports of lower prices being current. Regular rerolled bar manufacturers it is understood still will make concessions on attractive orders from the regular mill base, usually by not insisting on the full extra for twisted and deformed bars. While the miscellaneous volume of new bar business in this district the past week has not shown the increase of the preceding week it is continuing in fair proportions. Some of the larger producers report a sustained receipt of new specifications.

Steel Active, Iron Slow

Chicago, Feb. 11.—Business offering for soft steel bars is fairly good, and as the mills already have had considerable tonnage on their books they are in a comfortable position. Most buyers desire delivery at once and are not buying far into the future. Bar iron inquiry is better at present than it has been for several months and more buying is being done, the result being that mills are operating at a better rate. The quotation appears to be firm at 2.70c, Pittsburgh, or 2.97c, Chicago mill, and the tendency observed a week ago to shade this $1 per ton seems to have disappeared. Demand for hard steel bars rerolled from rails is extremely low, some mills operating part time and some being practically closed. No demand is being received from reinforced concrete builders and manufacturers are not actively inquiring. A bridge in St. Sebastian county, Arkansas will require 750 to 800 tons of reinforcing bars.

Want Steel Bar Forgings

Buffalo, Feb. 11.—There is some demand for bar material here from makers of drop forgings. The business is very small. What business there is is going to mills able to make quick deliveries. There is some disposition to believe fair tonnages of bar business are being held back due to an expectation of a drop in price.

Buying Hand-to-Mouth

Chicago, Feb. 11.—Manufacturers of bolts and nuts find orders coming in well, but most business is for small lots rather than the usual large tonnages. Consumers of this product are pursuing a hand-to-mouth policy and are taking only such material as they can use up promptly, evidently fearing to stock up at present levels. Most mills are busy and have sufficient business to carry them over any slack period.

Meeting Current Requirements

Pittsburgh, Feb. 11.—Current demand for nuts, bolts and rivets is not especially heavy nor are buyers ordering much in advance of their immediate needs. In some directions, notably large rivets, manufacturers are well booked, but in no line are they so crowded that they cannot make fairly prompt shipments against new business. Prices concessions being made on small rivets do not seem to be bringing much of an increase in the demand.

Not Meeting Cuts

Cleveland, Feb. 12.—Reports out of Pittsburgh that the prices on structural and boiler rivets have been reduced to $4.20 and $4.30, respectively, are having no effect upon makers in this territory, and prices remain firm with prompt deliveries. Low price offers are coupled with delivery far into the future. Few inquiries are out and little buying is being done, although the Foundation Co. Atlanta, Ga. has placed a fair-sized order with a Cleveland maker at full prices.

No Easing in Prices

Pittsburgh, Feb. 11.—Suggestions that the makers of cold rolled shafting were cutting the prices by allowing a greater discount from list prices than settled upon as of Jan. 1, find vigorous denial among manufacturers here. Demands, to be sure, are light and few of the makers have more than four or five weeks' business in sight, but it is not believed that the cut in prices would materially help business for seemingly it is more a question of actual wants than of prices that at present is governing the course of buyers. If there has been any easing in prices, it has been on resale tonnages. One manufacturer in this district recently was offered 500 tons of 2 5/16-inch rounds, screw stock, at a price way below the current market level. This tonnage, however, was refused, the manufacturer declaring that his business was to produce rather than to buy shafting.

Hoops and Bands Dull

Pittsburgh, Feb. 11.—Makers of hoops and bands in this district not only are getting only a few orders for hoops and bands, but are practically at the end of any old business that remained on their hands at the signing of the armistice. Mill activities in this direction consequently amount to little and unless some business soon is received, a good many mills probably will shut down. The price of 3.30c, Pittsburgh, for hoops and bands is firmly adhered to.

Buying by Cities

In Cast Iron Pipe More Liberal In West—Wrought Demand Fair

Chicago, Feb. 11.—After a long period of inactivity during which buying of cast iron pipe by cities has been almost absent, it has been resumed to some extent and the market presents a much more active aspect than has been the case for several months. The American Cast Iron Pipe Co. has sold 600 tons to the city of Minneapolis and the National Supply Co. has taken 1000 tons for Toledo. Bids will be opened today at Detroit on 2000 tons of 48-inch pipe. The city of Chicago will open bids Feb. 18 on 225 tons of 48-inch pipe. Denver will take bids Feb. 14 on 500 tons and Akron, O., Feb. 21 on 600 tons.

Eastern Demand Still Lags.

New York, Feb. 10.—Eastern makers of cast iron pipe still are being confronted with the excessive dullness of recent weeks. Inquiry is only fair and actual buying is practically nil. The largest business up at this time involves about 1500 tons of 30-inch pipe for Bayonne, N. J., bids on which will be closed Feb. 21. Another municipal inquiry calls for approximately 100 tons for Jersey City, N. J. Aside from this there is virtually no municipal inquiry, and demand from private sources is exceedingly light. Manufacturers, consequently, are taking advantage of the present situation to make plant repairs and to replenish stocks on certain sizes of pipe. Nevertheless, producers are exercising discretion in this latter regard owing to the possibility of further reductions in the price of raw material. Plants are now

operating at anywhere from 30 to 50 per cent of capacity.

Mills Are Well Engaged

Pittsburgh, Feb. 11.—Makers of steel and wrought iron and tubular goods are well provided at the moment with business and are getting a fair number of small orders. Between old and new business, the pipe mills are running on an average of better than 70 per cent of capacity. A good deal of oil country goods business is before manufacturers and quite a fair amount of new business of this character is coming out daily. The several big inquiries for line pipe which have been before makers for the past few weeks have not as yet been placed. Most of this business undoubtedly could be taken if manufacturers were prepared to make a slight concession in quotations, but this, they are refusing to do.

More Orders in Sight

Birmingham, Ala., Feb. 11.—While there has been no change in business conditions, cast iron pipe makers appear to be more hopeful of a change for the better soon. They report that some new specifications are in sight and believe bids on a tonnage will be called for. The local waterworks company is making extensions in the Birmingham district requiring 5 miles of cast iron pipe. Machine shops and foundries are workng on old business, with considerable new business in sight. New machinery is being placed in some machine shops and foundries in anticipation of business within 30 to 60 days. Cast iron sanitary pipe and fittings plants are receiving more inquiries.

More Activity

Is Shown in Tin Plate and Mill Operations Improve

Pittsburgh, Feb. 11.—Operations of the American Sheet & Tin Plate Co. at its tin mills continue at an extremely high rate and improvement is noted in the operations of the independent plants, although some of them still are shut down for want of business. On the whole, however, a fair amount of miscellaneous tonnage is being placed with the independent manufacturers who also report freer specifications against unfilled orders. The 60-day clause in the contracts for tin plate still are being observed. This clause involves specifications for April shipments by Feb. 15, and since makers of perishable food containers must have their tin plate by April the increase in specifications during the past week or so can be readily understood. Manufacturers are adhering firmly to the quotation of $7.35, Pittsburgh, per base box for tin plate and are not disturbed by stories of resale business at lower figures. A Pittsburgh district manufacturer recently took off the hands of the government 2000 cases or approximately 4000 boxes of tin plate at a price of $7.75, net. This tonnage was of special weights and sizes and was originally intended for export to France, but was completed just about the time of the signing of the armistice and never left the country.

Big Plate Tonnage Needed

New Vessel Contracts by Fleet Corporation Call for 120,000 Tons of Steel—Navy Program Will Involve 60,000 Tons

Philadelphia, Feb. 11.—Approximately 120,000 tons of steel, including 78,00 tons of plates and 35,000 to 40,000 tons of shapes will be required for twenty 20,000-ton cargo carriers which have been awarded to a large Philadelphia shipyard by the Emergency Fleet corporation. Each of these vessels will require from 5000 to 6000 tons of steel. No steel contracts in connection with this business yet has been let, but it is indicated that this business shortly will be distributed. The American Locomotive Co. bought slightly less than 5000 tons of plates last week for 110 locomotives for domestic roads all at 3.00c, Pittsburgh. Eastern plate makers say that the past week's bookings have been much in excess of preceding weeks but that they are still far below shipments. Some plate orders have been placed for export.

Bids recently asked by the navy department on 16,000 tons of material for four battleships and a fuel ship represent only a portion of the authorized navy construction about to proceed. The total program calls for approximately 60,000 tons of steel.

Beginning to Need Orders

Pittsburgh, Feb. 11.—Platemakers in this district have a fair amount of ship and car business before them but this sort of work is beginning to become cleaned up and some makers who hitherto have been in no position to accept further orders, now admit that they can take on tonnages provided prompt shipment is not demanded. All makers are in a position to handle tonnages of tank plates but such business is not at all plentiful. Prices are firm and unchanged.

Want Tonnage for Furnaces

Cleveland, Feb. 11.—Bids are to be taken by the engineers in Cleveland soon on 3000 to 4000 tons of plates for two blast furnaces which are to be erected near Calcutta, India, by the Indian Iron & Steel Co. The New York Central railroad is inquiring for about 500 tons practically all plates for shop work here. A local hoisting machinery builder is inquiring for some tonnage to cover an export order. Local mill representatives report new plate sales are less numerous.

Ship Changes Delay

Chicago, Feb. 11.—Although most steel producers have considerable tonnage of ship plates on their books, the decision of the United States shipping board to change its plans for ships has delayed specifications on these contracts. This is not expected to have any serious effect and mills expect to resume full shipments in a short time.

Donner Plant Down

Buffalo, Feb. 11.—With the exception of its blast furnaces, the entire plant of the Donner Steel Co. in this city has been closed. The works will resume only when their order book justifies.

20,000 Cars

For Expeditionary Forces to be Carried Out—40,000 Lot Uncertain

Philadelphia, Feb. 11.—Car producers have been advised of a decision at Washington to proceed with the construction of one lot of 20,000 cars for the expeditionary forces of the army in France. No decision yet has been reached with reference to the second lot of 40,000 cars for a similar destination. It is presumed that the later construction will not be carried out.

Business is Slack

Pittsburgh, Feb. 11.—The mills that are engaged on purely railroad work are running at a lower rate of activity than practically any other of the steel finishing plants. The railroad administration continues to move with extreme caution in the matter of rail purchases and is not buying track bolts or spikes in any greater quantities than are needed for immediate use. It would seem as though at least inquiries should be coming out by now for the rails that would be laid this spring and the trade is inclined to attribute the lack of some interest in supplies on the part of the railroad administration to the controller of the treasury, whose reputation for close buying is widespread. Demand for light rails and for small spikes has dwindled to infinitesimal proportions as a result of the curtailment of coal mining operations on the one hand and slowing down of industrial activity and the attendant decline in the requirements of light rails on the other.

Need Many Track Fastenings

Chicago, Feb. 11.—Although railroads have been buying considerable track fastenings during the past few weeks, the volume of this business is not as great as it should be to prepare railroads for their spring track work. Within the next 60 days all railroads will require a large tonnage of this material, but under present uncertainty as to buying the business is not being placed. Usually this material can be obtained within a short time from one source or another and probably by April 1 heavy orders will have been placed with mills. Standard steel rails are being shipped in large tonnage but no present buying is being done. No activity is manifested in the freight car market and builders are working on old orders entirely.

Foundry buildings at the former plant of the Wharton Switch Works, Twenty-fifth street and Washington avenue, Philadelphia, have been sold to Charles A. Shetzline.

Shell Steel Offered Low

Rerolling Plants Able to Obtain Round Tonnages at Attractive Figure —Some Lots Are Absorbed—New Steel Demand Maintained

Cleveland, Feb. 11.—Offerings of shell blooms and billets from stocks accumulated by muntion plants as the result of the cessation of hostilities have been coming more into prominence in this district. This material is obtainable at various prices ranging from $20 to $25 per ton. A manufacturer of reinforcing bars is understood to have bought a tonnage of this material recently at $30. A local jobber was a purchaser of a tonnage to be coverted into bars, shapes, etc., under arrangement with a nearby mill. A lot of 10,000 tons at a western Pennsylvania point where munition production was actively carried on has figured in negotiations here. Usually these have been in connection with conversion deals for certain finished products. On new semifinished steel, such buying as is being done is in minimum quantity. Miscellaneous new business and specifications against running contracts continue sufficient to enable the local producer to maintain full operation.

Seek Forging Billets

Chicago, Feb. 11.—Demand for forging billets, which has grown up within a short time in this market, continues active, an unusual feature of the steel trade here. Much of this demand comes from Canada and Japan, but much more than usual is being asked by domestic manufacturers. Steel men here are somewhat puzzled at the sudden accession of demand for this product and wonder why it did not manifest itself before the war as well as now.

Export Inquiry is Good

Pittsburgh, Feb. 11.—Numerous export inquiries are coming out for rerolling billets and slabs, and quotations against such demands are heavy, although as yet only trifling tonnages actually have been booked. Only a small premium now is asked over domestic levels on foreign business. Domestic demands continue few and for small tonnages. Nonintegrated mills either are well covered by contract or can secure their requirements at regular sources, as open market activities have been almost nil for the past few weeks. No demand goes unsatisfied these days, yet in spite of this condition of dullness, efforts to force a decline in prices have been unsuccessful.

Buy Sheet Bars Lightly

Youngstown, O., Feb. 11.—Sheet bar buying throughout the valley is in small lots only, ranging as low as 10 to 15 tons. Consumers are anxious to get immediate deliveries and most of the buying is done on this basis now. One day late on deliveries usually brings the buyer and maker together which indicates that not many bar banks are stocked. In fact, nearly all bar tonnages being placed now are fully covered by sheet orders. Export inquiry for semifinished material, especially sheet bars, is extremely good now considering general market conditions. Some business is being done but only in small volumes.

Strip Steel More Active

Pittsburgh, Feb. 11.—Demands for cold rolled strip steel continue to increase both in number and in size and one Pittsburgh district manufacturer, whose plant recently was on a one-turn basis, went to a two-turn schedule this week. The inquiry is from a number of sources but is especially active from the automobile trade.

Sheet Operations Heavier

Industry Now Averaging 75 Per Cent—Chicago Mills Run Full—Automobile Sheet Supply Tightens—Resale Offers Continue

Pitsburgh, Feb. 11.—Electrical and automobile shets are in good demand and most makers in this and nearby districts are well booked on these classes of material. Ordinary black, galvanized and blue annealed sheets are not called for with any freedom at present, but the manufacturers are well boked on these lines and specifications against contracts are fairly good. Demand for automobile sheets is so urgent that a fear is expressed in some quarters that there will be a shortage before summer, quite as acute as that which existed about a year ago. An increased output of galvanized sheets is probable, owing to the big decline which recently has taken place in the price of spelter. Galvanized sheets were rather unprofitable at the prices at which they had been selling, but with spelter down to 6.20c a pound, as against the recent price of more than 7.00c, the margin of profit is somewhat enlarged. Sheet mills generally continue to run at a higher rate of operation than most other steel finishing mills. At the moment the American Sheet & Tin Plate Co. is running about 80 per cent full and the independents at about 70 per cent, making an average for the entire industry of approximately 75 per cent.

New Inquiry Improves

Buffalo, Feb. 11.—A somewhat better inquiry for sheets has developed. Automobile makers constitute part of this demand and this business is coming in in comparatively fair tonnage.

Operations Are Maintained

Youngstown, O., Feb. 11.—Sheet buying throughout the valley continues to lag and, as a consequence, makers are skirmishing for business. While no large business is being done small orders are plentiful enough to keep the mills in operation at about 70 per cent of capacity. In nearly every case deliveries can be made immediately. Most sheetmakers who buy this steel are ordering their semifinished material in small lots which is significant of the fact that they are buying only such quantities as are covered by orders. Inquiries coming to the valley are much the same as the volume of business being placed; they are mostly for small quantities and rarely include the galvanized grade. Once in a while a large inquiry will come out but when run down, it eventually turns out that the inquirer has a quantity of sheets for resale and is merely trying to get on the right side of the market.

Probably during no period in the past 12 months has there been such a variety of sheet available for immediate delivery from valley mills as there is now. One company is offering approximately 2000 tons of one-pass, cold-rolled, box-annealed soft sheets ranging from Nos. 13 to 28 gage at 4.50c, mill base; 173 tons of tight-coated galvanized; 250 tons of single-pickled, soft open-hearth, annealed, cold-rolled, patent-leveled, resquared and oiled sheets based on 5.50c for No. 22 gage; 167 tons of full cold-rolled, japaning sheets, patent-leveled, resquared and oiled; two to three cars of one-pass cold-rolled, box-annealed prime stock of assorted gages from Nos. 14 to 28, but sizes unassorted at 4.50c, base; and two cars of automobile body seconds, No. 22 gage, at 5.55c; and full-pickled, full cold-rolled and reannealed deep-drawing stock at 5.40c.

Resale Lots Still Offered

Cleveland, Feb. 11.—Offering of resale lots of sheets at varying levels below the market which the mills are maintaining are appearing here and there in this district. These concessions in some cases are large. The imperial munitions board of Canada has asked for bids on 300 to 400 tons of No. 14 black sheets and fittings for the manufacture of steel barrels. Local consumers in this line have not been interested.

Demand Equals Production

Chicago, Feb. 11.—Demand for steel sheets is steady, but not excessive. At present it is about equal to production of mills, which are now operating at full capacity. This is a relatively comfortable position but does not give opportunity for accumulation of a backlog to insure future operations. Most buying is in comparatively small tonnages and for nearby delivery, manufacturers apparently holding the opinion that they may profit by not overloading at present prices.

Export Market Begins to Develop

Some Inquiries from Many New Propositions, Freed by Lower Freight Rates, Are Materializing—Present British Advantage Expected to be Neutralized by Further Cut in Carriage—Holland Virtually Closes 20,000 Tons

NEW YORK, Feb. 11.—Export iron and steel prices are inclining lower and foreign purchasers are holding out for the bottom quotations. The recent reductions in ocean freight rates had the psychological effect of drawing out a multitude of inquiries, but the Jan. 1 schedule of iron and steel prices apparently is holding up many of these orders. The present reduced ocean freight rates probably will not bring a large volume of business immediately, but they have helped in some cases to produce orders for the tonnage of export business booked generally by the mills during the past 10 days or two weeks has been much heavier than in any similar period since the armistice was signed. The present reduced ocean rates are full of inequalities and they are effective on but a comparatively few vessels. But the rates have indicated to the foreign buyers that ocean transportation is beginning to go back to normal. The buyers are inclined to believe that the rates will be right and cargo space adequate by the time their orders are to be shipped. Therefore there has been exhibited a disposition to make contracts for new goods if the rock-bottom prices can be had.

Influx of Cabled Inquiries

The sudden influx of cable inquiries resulting from the reduced ocean rates cannot be accepted as assuring any great or quick change in the market. The low shipping board rates apply only on shipping board vessels and these are scarce. One agent was happy to be able to book 100 tons of steel on a shipping board vessel during the past month. It is almost impossible to move large tonnages under these rates. The English ocean rates do not apply from American ports to our foreign steel markets, but only between English ports and those markets. Privately-owned ships, vessels under the Japanese, Norwegian and other flags, can be found to take the cargoes but they are not bound by the cut rates. They will quote what they can obtain on the tonnage.

The fact that the rates are beginning to come down, and the general conviction that steel prices cannot be reduced radically, is believed here to have drawn out the numerous inquiries received last week. These cabled inquiries came from Italy, China, Japan, South Africa, Holland, Sweden, France, Finland, Denmark and South America. They have been generally distributed but probably not more than a small portion will develop into business. The inquiries from Finland and Denmark are very promising, according to the view of one American house. Another declared he had received not a single inquiry from South America. Some notable inquiries have been received from the French committee on rehabilitation. Another American house has about closed orders with South American purchasers for general lines, including sheets rods and tin plate. Spanish purchasers are apparently coming back into the market after once instructing their American agents to hold up all previous orders pending instructions. Inquiries for stock have come from Lisbon and Madrid.

It is not unusual at the present time for a week to go by without a consignment of steel leaving the port of New York. A small shipment has been an occasion of comment. The reception accorded the flood of inquiries now at hand by the American producers, therefore, is the point regarding which local agents have been most concerned. They express satisfaction over the fact that the producers have consented to discontinue asking a $20 premium on export business. But pressure is being brought to bear to whittle down the price even below the domestic market.

According to the rate schedule announced by the shipping board recently, a rate of $28 per ton of 2240 pounds to Havre and Bordeaux, $30 to Antwerp and Rotterdam, and $40 to Marseilles, Barcelona, Cette, Genoa and Naples, has been quoted on shipping board vessels, if the cargo can be found. A rate of $15 a ton on naked steel and $18 a ton on packed steel from North Atlantic ports to Australia and New Zealand was quoted to meet the rate on British ships from English ports. A cut of 60 per cent in the Pacific coast rate has been announced. Shipping agents find the new schedule full of inequalities. For instance while the rates to France have been cut the old rate to Spain still applies, making it cheaper for American shippers to send to England on British ships and there transship.

The ocean rate reduction must not be taken to mean an immediate stimulus to shipments. At best it can mean but that these charges are likely to approach normal about next summer, the time when American mills will be ready to deliver on orders placed now. Therefore the American mill has the advantage over foreign competitors on forward business. The average English mill or furnace price is today higher than the American price, although the freight situation places the English producer in a decidedly favorable position as to most of the important buying centers. This situation has an opposite effect, however, upon business for immediate delivery. A sample of this was found recently in a bid on 500 tons of pig iron on which the American producers quoted $30, furnace, whereas the English named $32, furnace. The price on the American iron, c.i.f. Yokohama, however, was $84.75 while that on the British iron was nearly $30 less. The order was consequently lost. Within the past week, however, the ocean rates from the Pacific coast have been reduced approximately 60 per cent.

Inquiry from South America

An inquiry from South America for 400 tons of bar iron has developed. Chicago producers have offered to fill this at 3c, Chicago mill. Eastern producers are holding for 3.50c, mill, which prevents the order being filled there. The iron is for shipment through a southern port. An inquiry, which has all the earmarks of developing into an order, has been received from Japan for 4000 tons of 45-pound rails and 1000 tons of 12-pound rails. There are some larger rail inquiries current for Japan. Japan also is ordering freely against tonnages previously placed for shipbuilding material. Upwards of 50,000 tons have just been specified.

The business done in export has not been sufficiently extensive to establish a market, yet all the agents feel inclined to make a guess at the prices which they feel confident they can get from domestic producers. For instance, whereas cut nails have been selling at $5, Pittsburgh, a tentative offering of $4.75, Pittsburgh, is being made. There has been a little export business in nails. Plates for export can be purchased at 2.90c, Pittsburgh. One sale of tank plates for the Far East has been consummated at a price, it is understood, slightly less than 3c, Pittsburgh. According to report circulated in the market, one particular offer of ship plates rolled to Lloyd's specifications was offered at a very attractive price. This offer included some 20,000 tons but it was peculiar and while the price quoted may have been extremely low, it could not be taken as a basis of export prices.

Holland has virtually closed for 20,000 tons of ship material with the Steel corporation.

Steel is First in Stabilizing Plan

Secretary Redfield's Proposal if Favored by President Will Start With Steel Industry —Cables Urge President to Act But No Word Yet Received—No Price Fixing is Attempted, Says Commerce Secretary

WASHINGTON, Feb. 11.—Steel will be the first commodity which Secretary of Commerce Redfield's advisory committee, if appointed, will consider in the endeavor to stabilize prices in the industries without touching the scale of wages now existing, Mr. Redfield stated today. Following this, concrete, lumber and other building and structural materials will come under consideration of the committee.

Already, Mr. Redfield said the International Harvester Co. and other manufacturers had expressed to him their willingness to cut the price of their products as much as 25 per cent. Some companies hold back, the secretary thinks, because they are in fear of the Sherman antitrust law and in view of statements issued by the department of justice declaring that any concern attempting to act in opposition to the Sherman law would be prosecuted to the full extent of the act.

President Wilson has not been heard from on the subject, although Mr. Redfield cabled him several days ago. An interesting development in the case, however, is that Secretary of the Treasury Carter Glass has sent a lengthy cablegram to the President, stating his views as to how the work of this committee would affect the Victory loan about to be launched and advising that the President accept the views as set forth by Mr. Redfield in his cable. This co-operation by Mr. Glass was unlooked for at this time and has caused some surprise in Washington.

In an interview today Secretary Redfield has taken exception to published statements that his plan involves the fixing of prices. His attitude has been the source of considerable speculation because the commonly-accepted view is that his official statement issued last Friday gave a clear impression that not only is it contemplated to fix prices but to reduce them without lowering wages.

In his announcement referring to the advisory committee he seeks to have appointed, Secretary Redfield said: "It was contemplated that this committee should call into conference the representatives of the basic industries of the country to examine conditions in industry with a view to the formulation of a scale of prices at which the government departments and other buyers would be justified in buying freely and at which the manufacturers would be willing to sell with a view to maintaining or restoring business activities to a full volume."

This statement, it is pointed out, clearly means the fixing of prices, although that exact term is not used but instead the phrase "formulation of a scale of prices" is employed.

It is obvious that any formulation or fixing of prices under the secretary's plan could be only suggestive in the absence of any additional legislation. It is questionable whether he has a right to make any voluntary agreement with the industries to attempt to establish a basic scale of prices. War powers under existing statutes including the Overman act permitted this price arrangement while the war was actively on. In this connection it might be well to recall that the department of justice recently emphasized that the Sherman and other antitrust laws are still in effect and that the secretary of commerce has not shown how these may be evaded in his proposed plan.

Statutes already on the books provide that practically all government peace-time purchases must be made in the open market and under competitive conditions. Unless these laws are revised or new ones are enacted, which apparently is out of the question, W. W. Warwick, comptroller of the treasury likely would hold up all vouchers authorizing payments at prices suggested under the proposed plan of Mr. Redfield. Steel manufacturers to some extent, notably in the matter of basing prices at certain points in order to equalize freight rates, have encountered rulings of the comptroller which apply to contracts and vouchers not properly drawn or executed in accordance with statutory provisions. That many manufacturers would decline to enter into any agreement with any government official in the face of these conditions is apparent.

Equipment and Rail Orders Await Price

WASHINGTON, Feb. 11.—Upon what congress does in making appropriations as asked by Director General Hines of the railroad administration in his efforts to obtain an additional $750,000,000 for the so-called revolving fund, depends what the railroads will do this year in buying new equipment. The purchasing question also hinges upon what prices will have to be paid for cars, rails, etc., and to what extent the administration will be able to make the carriers accept the 100,000 freight cars originally ordered and now being built. This latter phase involves the ecceptance by the holding corporations of the contracts prepared by the administration under the provisions of the railroad act of March 21, 1918.

At present it is the hope that the administration will have $491,000,000 to devote to capital expenditures, although it is expected the amount which will go into new equipment will run from $100,000 000 to $200,000,000. The indefiniteness of this fund is due largely to the fact that traffic has fallen off, that deliveries under the original order of 100,000 cars are still being made and will be for some time, and that prices of materials are too unstable and too high in the estimation of the railroads. Except for some heavy buying of rails and track material, it is not expected the railroads will exceed the estimated maximum of $200,000,000 for new cars. It is confidently believed no more locomotives than the 2030 already ordered will be purchased.

The difficulty the administration is having in getting the railroads to accept the allocations of the 100,000 cars is an important factor in the program. Approximately 22,000 of these cars have been built and about

3000 of them are being held at the manufacturing plants waiting until the railroads accept them. The railroad administration has placed about 30 of the contracts required under the law, the roads accepting the contracts having taken the 19,000 cars already delivered. There are approximately 150 of these contracts yet to be formally accepted by the carriers' corporations. The administration, in getting these acceptances, expects to dispose of the remaining 81,000 cars, built and building.

The railroads' objections to the cars are that they cost too much averaging $3000 each; are too heavy in some instances; too light in others; of insufficient capacity; unsuitable to the traffic handled; and numerous other reasons. Many of the original allocations have been shifted to make the types fit with the requirements of the roads accepting them. Some roads, notably the Virginian, have been given permission to build certain types of cars, but many of these orders have been held up because of the cost of materials. It had been contemplated for the roads to build some 800 passenger coaches and some general purpose, stock, refrigerator and other kinds of cars, but these have been postponed either because of the falling off in traffic due to the end of the war or for other reasons.

Of the proposed $750,000,000 addition to the revolving fund, $368,000,000 is intended for loans for capital expenditures which, the administration will not make unless the corporations consent to them. The remaining $381,000,000 would go to squaring accounts for the first year of federal operation. As the proposed $368,000 000 for capital expenditures would require about $125,000 more to make up the total budget of $491,000,000, it is the belief of the administration the railroads themselves would be able to furnish this additional sum from about $150,000,000 of their own funds from surplus earnings. This would still make allowances for other loans through the general revolving fund.

The administration is still making car repairs at top notch speed, the latest order calls for the return to the Erie of 25 of its 16,000 series. These are to go to the Illinois Car Co.'s shops at Urbana, O. Other lines have recalled many of their cars for similar purposes.

Deliveries of locomotives continue favorably, according to administration officials. In the week ending Feb. 1, 40 were delivered, 23 by the American Locomotive Co. and 17 by the Baldwin Locomotive Works.

Rail deliveries are said to be at the rate of 50,000 to 60,000 tons monthly. The unfilled tonnage is sufficient to keep the mills busy till April. The prices accepted by the army and navy with the approval of the price fixing committee of the war industries board still are regarded as too high by the administration and railroad officials. These prices $55 for bessemer and $57 for open hearth, later were put into effect by many of the manufacturers after government control ended Jan. 1. The administration hopes, according to reports, that price arrangements can be made for the placing of additional rails by April 1 so that deliveries of track material will continue without interruption. The deliveries now being made are on old contracts.

Honor Pig Iron Chief

In recognition of the able and patriotic service which he rendered to the country and to the iron industry, J. C. McLauchlan,, former chief of the pig iron division of the war industries board, was presented with a handsome gold cigaret case at a joint meeting of the Eastern and Virginia pig iron associations, at the Bellevue-Stratford hotel, Philadelphia, Feb. 5. The presentation was made by W. W. Lukens, of the Alan Wood Iron & Steel Co., Philadelphia. The case which is of unusually handsome design and workmanship bears this inscription: "Presented to J. C. McLauchlan by Members of the Eastern and Virginia Pig Iron Associations in Recognition of Services Rendered to His Country as Chief of the Pig Iron Division of the War Industries Board, Washington, D. C., 1917-1918."

Tool Builders Not to Buy Government's Machines

A special meeting of the New England members of the National Machine Tool Builders' association was held at the Bancroft hotel, Worcester, Mass., Feb. 7, to discuss whether or not the builders are willing to repurchase government-owned machinery and machine tools. Meetings likewise were called in Cincinnati, New York and other sections, but none was held and members in those districts will be asked to vote by letter.

About 40 members attended the Worcester meeting at which President Albert E. Newton, of the association, presided. It was the unanimous opinion that before any of the government-owned stocks of machinery were purchased by the companies represented, the industry should have a complete inventory. Three months is the time set to take this inventory. It was the consensus of opinion that the members should refrain from purchasing any second-hand machinery owned by the government. The meeting indorsed the bill now pending in congress, which provides for the distribution of this machinery and equipment among the trade and technical schools of the country by the war department.

President Newton was authorized to convey this decision to senators and congressmen and go to Washington to confer with C. W. Hare, director of sales on the subject. He expressed his belief that the government should give the machine tool industry a protective tariff because under proposed conditions, European countries are relieved of all competition.

Ingot Production

For January Shows a Gain Over December of 90,121 Tons

Steel ingot production for January made a decided gain, the total output being well above the December figure. Statistic issued by the American Iron and Steel institute indicate a production of 3,082,427 tons in January by the 29 companies which in 1917 made 85.10 per cent of the country's total. This is a gain of 90,121 tons over December, when the production fell to 2,992,306 tons, and is 21,667 tons above the November total of 3,060,760 tons. In January, 1918, due to lack of fuel and transportation difficulties, the output was only 2,203,845 tons. Using the reports of these 29 companies as a basis, the country's ingot production for January was approximately 3,622,000 tons.

Compared with December, the open-hearth ingot production increased 52,613 tons, the January output amounting to 2,325,802 tons, and December, 2,273,189 tons. Bessemer ingot production was 749,346 tons, as against 706,844 tons in December, a gain of 42,502 tons.

Production figures compiled by the institute from January, 1918 to January, 1919, are as follows:

Months	Open hearth, gross tons	Bessemer, gross tons	All other, gross tons	Total, gross tons
Jan., 1918	1,763,356	429,588	10,901	2,203,845
Feb.	1,805,233	454,457	14,051	2,273,741
Mar.	2,331,048	763,255	16,078	3,110,381
Apr.	2,377,974	769,249	16,187	3,163,410
May	2,475,131	796,244	15,858	3,287,233
June	2,281,718	786,380	15,348	3,083,446
July	2,311,545	784,997	17,093	3,113,635
Aug.	2,299,177	766,860	17,643	3,083,680
Sep.	2,407,993	772,863	16,802	3,197,658
Oct.	2,527,776	807,043	17,377	3,352,196
Nov.	2,291,720	753,409	15,631	3,060,760
Dec.	2,273,189	706,844	12,273	2,992,306
Total 1918.	27,145,860	8,591,189	185,242	35,922,291
Jan., 1919	2,325,802	749,346	7,279	3,082,427

Contract Bill

Minus Appeals and Affidavit Features Approved

Washington, Feb. 11.—The report of the conference committee's agreement on the war contract bill was presented to the house yesterday by Representative Dent, and was to be presented to the senate today. It is expected that the measure will be ready for the signature of the president upon his return to the United States.

The house and senate conferees eliminated the proposed appeals commission, but retained sections, slightly amended, providing for reimbursement to producers of minerals who increased their output at the request of the governments. The senate conferees yielded on the so-called McKellar amendment which required the war department officials to make affidavits that they had no personal interest in contracts. Claims are to be adjusted by direct negotiation between manufacturers and the war department, and, in case of disagreement, the former can appeal to the court of claims.

While it was organized some time ago, announcement was not made until last Friday by Secretary of War Newton D. Baker of the creation of a war claims board to supervise and co-ordinate the work of the various war department agencies engaged in the settlement of claims resulting from the termination of contracts or other procurement obligations, and to authorize and approve such settlements. The board will pass upon both formal and informal contracts.

Through special representatives of the board sitting with the various bureau boards of contract adjustment the adjustments of the bureaus are subject to its scrutiny and approval, and adjustments involving matters of policy and of particular difficulty and importance are brought before the full board for decision. The members of the war department claims board are:

Benedict Crowell, assistant secretary of war and director of munitions, president; G. H. Dorr, assistant director of munitions; Brig. Gen. George W. Burr, assistant director of purchase, storage and traffic; Brig. Gen. Herbert M. Lord, director of finance; Lieut. Col. Herbert H. Lehman, assistant to the director of purchase, storage and traffic.

Special members of the board are: W. H. Davis, for ordnance department contracts and obligations; Col. C. A. McKenney, for contracts and obligations of the purchase and storage division; Maj. H. L. Goodhart, for contracts and obligations of the chemical warfare service, medical corps an dsignal corps.

Youngstown Sheet & Tube Earns $25,952,119

President James A. Campbell's report presented at the annual meeting Feb. 11 showed earnings from operations for the Youngstown Sheet & Tube Co., for 1918 of $24,675,580. Earnings from investments totalled $1,276,539, making the gross earnings $25,952,119. In 1918 the company's sales fell off $5,000,000 as compared with 1917 and shipments were decreased by approximately 35,000 tons. Despite this fact wages paid aggregated $22,157,000 as against $16,396,000 in 1917. Charges for depreciation were $2,500,000, while $8,862,630 was written off for cost of construction for war purposes and adjustments. Dividends paid were $4,394,721. The net surplus was $10,194,767. No allowance has been made for the payment of federal taxes and President Campbell pointed out that if the 80 per cent tax is retained, the company's taxes would be between $8,000,000 and $10,000,000 and absorb its earnings in excess of regular dividends.

All members of the board of directors were re-elected. They are: Robert Bentley, C. H. Booth, J. G. Butler Jr., James A. Campbell, George E. Day, E. L. Ford, Richard Garlick, C. D. Hine, Amasa Stone Mather, John L. Severance and Hugh B. Wick.

D. J. Ryan of the Allyne-Ryan Foundry Co., Cleveland, has purchased the Ecorse Foundry & Machine Co., located at Ecorse, Mich.

The Non-Ferrous Metals

Copper Lead Spelter Tin

	Copper	†Spot Straits, tin	‡Lead, New York basis	Spelter St. Louis basis	Aluminum	Spot antimony
Feb. 5	18.75	72.50	5.25	6.25	33.00	7.25
Feb. 6	18.50	72.50	5.25	6.35	33.00	7.25
Feb. 7	18.25	72.50	5.00	6.45	33.00	7.12½
Feb. 10	18.25	72.50	5.00	6.50	33.00	7.00
Feb. 11	18.00	72.50	5.00	6.45	33.00	7.00

†United States Steel Products Co.'s price to consumers, dealers and jobbers.
‡American Smelting & Refining Co.'s price.

NEW YORK, Feb. 11.—Interest in the non-ferrous metal markets the past week has been centered on the copper situation. The secretary of labor at Washington held several sessions recently with representatives of copper labor unions, at which some interesting facts were developed. One of these facts was that in the last 75 days not more than 5 per cent of the copper output was bought. Another fact brought out was that there is a surplus of about 1,000,000,000 pounds of unsold copper in this country above ground.

After having held at the nominal price of 23c, since the first of the year, the leading copper sellers last week reduced their quotation to 18.50c, f. o. b. refineries, and did some business at this level. Smaller sellers already had been quoting around this level and at once cut their price to 18c. Yesterday leading sellers cut to the same level, with March delivery 17.50c.

With the copper market in such a situation, production has been curtailed nearly 50 per cent and an adjustment of wages has been necessary. The sliding scale of wages in the several copper districts is to be restored on the old basis, with 18c a pound as minimum. This adjustment has been seized by I. W. W. agitators in Montana and some other districts to foment trouble, but with the present large surplus of copper to be sold, producers are not anticipating much trouble. Casting copper is in light demand, some high grade resale metal being offered at 17c, without takers. The market is quoted about 17.25c, nominal. Lake copper is quoted nominally 19c.

Brass and copper rolled and drawn products have been reduced rapidly, a drop being made today by some mills, to 28c for hot rolled copper, 33c for seamless tubes, seamless brass 32c high brass sheet and wire, 22.75c.

The spelter market took a turn for the better last Thursday, having sold down to 6.20c, East St. Louis basis, last Wednesday. On Thursday, business was done at 6.35c, East St. Louis, while on Friday 6.40c was bid for February shipment, with 6.50c asked. On Monday the bottom quotation was 6.50c, for prompt February and March shipment. Today the market was a little weak. High grade spelter is quoted 8.50c to 9c, East St. Louis.

The American Smelting & Refining Co. last Friday reduced its lead price to 5c, New York, 4.70c, East St. Louis. Outside sellers previously had been quoting 4.95c to 5c, New York. This action by the leading interest was followed by a better volume of inquiry for lead than in several weeks, with a firmer tone to prices. Some of the outside sellers refused to quote. Lead sheets are down to 8c.

The tin situation shows little change from week to week. The tin administration now is granting licenses to consumers only for tin held in stock by the United States Steel Products Co. This eliminates the domestic smelters from the market, excepting in lots of five gross tons or less, on which licenses are not required. The price of domestic smelted electrolytic tin is about 68c; 99 per cent tin, 66.50c, prompt shipment, f.o.b. smelter.

Antimony is dull and weak. The market for spot metal is quoted 7c to 7.12½c, duty paid, New York.

The Aluminum Co. of America has decided to quote 33c on business after March 1, 1919. This is the price fixed by the government in 1918 to expire March 1, 1919. Outside sellers are quoting 31.50c to 32c on virgin ingot. No. 1 remelted is about 28c and No. 12 alloy about 26.50c.

Casting Process for Cutting Tools

Tests Indicate That Forming Tools Can be Produced by Casting Free from Blowholes and Sufficiently True to Form to be Finished Merely by Grinding the Cutting Edges

BY J. E. JOHNSON JR.

SINCE the invention 18 years ago by Taylor and White of a process of heat-treating steel tools, the production of metal-working tools has been revolutionized. This was an exceedingly important invention, although it consisted principally in establishing the fact that, while overheating, when it accidentally occurred in the ordinary process of forging, spoiled the steel, it resulted in imparting a cutting power several times as high as had ever been obtainable before, if carried much farther or to a point that would have been considered absolutely ruinous to the steel under the old ideas.

The quality that gives the steel this power eventually received the name of "red hardness." This name originated in the fact that tools possessing this property retain their resistance to deformation even when subjected to such severe cutting stresses that the metal just back of the point is heated under certain conditions to a visible red. It is interesting in this connection to note that the edge of the tool itself does not become red because it is continually cooled by the fresh metal into which it is forced.

Older Types of Tool Steel Disappearing

The result of Taylor and White's invention was an intensive study of tool steels all over the world and, although there was great diversity of analysis in the high-speed steels of the early days, these steels today generally have an approximately similar composition, the principal constituents being from 15 to 20 per cent of tungsten from 4 to 6 per cent of chromium, from 1 to 2 per cent of vanadium, and from 0.50 to 1 per cent of carbon. It is probably safe to say that standard brands of such high-speed steels will do from five to ten times as much work in a given time as the carbon steels, and even the mushet steels, which were the sole dependence up to the beginning of this century, when the Taylor-White process was discovered. With the increasing cost of labor, it is not surprising that these steels have driven from the market, for all but limited purposes, the older types of steel.

These types of steel are harder and more difficult to work than ordinary carbon steel. It was for several years considered impossible to weld them at all and, while this can be done now, it is not a process that commends itself to the best toolmakers. For the ordinary run of tools made from straight bars, such as those used for lathes, planers, and shapers, the processes of manufacture have not been much more difficult and expensive than the same processes for the older tools, the steel being cast into small ingots and then rolled or hammered to bars of the desired section, from which the desired form of tool is produced by forging and grinding a cutting edge on one end. For formed tools, such as milling cutters, large drills, countersinks and other shapes that do not lend themselves to production from the straight bar, the conditions are different from those obtaining when carbon steel is used.

In the first place, the expensive alloys, tungsten, chromium, and vanadium, that must be liberally used to produce these tools make the cost of the molten metal many times higher than the cost of the carbon steel of old. Under the conditions prevailing in recent years the difference can almost be expressed in terms of dollars per pound for the new product instead of cents per pound for the old. Second the production of a milling cutter or similar formed tool by existing methods is an expensive operation. First a blank of suitable size must be produced by forging an ingot, or large bar, and if the cutter is at all large, a bar of extra large size must be produced in order to make it. After forging, the rough blank is annealed and then sent to the tool room for machining. This must be done with great care and accuracy, and usually involves a multiplicity of operation, since the formation of each tooth involves several cuts. The labor that does this work is deservedly the highest priced mechanical labor we have today, and its speed is necessarily limited for the reason that in forging, which is a rough operation, much stock must necessarily be taken off in the production of formed cutters, and the stock to be removed is far harder and more difficult to machine, even after thorough annealing, than was old-fashioned carbon steel.

Why Formed Tools Cost More

The production of formed tools by these methods is extremely expensive, for two reasons: First, a large percentage of the weight of the forged blank must be cut away, resulting in chips of fractional value as compared with the value of the forged steel. Second, the labor involved in machining the tool to shape is great in amount and expensive in quality.

At different times in the last two or

From a paper to be presented at a meeting of the American Institute of Mining Engineers, Feb. 17-20, New York. The author, J. E. Johnson Jr., is a consulting engineer and metallurgist, New York.

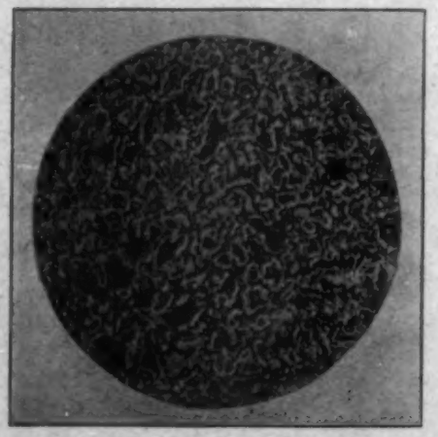


FIG. 1—SECTION OF CUTTER MADE BY THE DAVIDSON PROCESS. ETCHED IN 5 PER CENT NITAL SOLUTION FOR 30 SECONDS. X 100

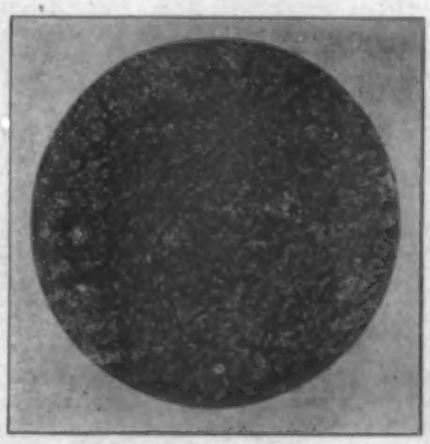


FIG. 2—SECTION OF CUTTER MADE BY THE DAVIDSON PROCESS. ETCHED IN 5 PER CENT NITAL SOLUTION FOR 30 SECONDS. X 400

FIG. 3—SECTION OF MILLING CUTTER TOOTH MADE BY THE DAVIDSON PROCESS. ETCHED IN 5 PER CENT NITAL SOLUTION FOR 7 MINUTES. X 400

three years, various people have conceived the idea of casting tools to shape and some progress has been made in this art. It is understood that one large manufacturer has such a process in more or less regular commercial use. There are three difficulties with this process, from the point of view of ordinary steel melting practice: First, that of getting the steel killed so dead that it will be free of blow-holes as cast; second, that of producing a metal fluid enough to flow into the fine parts of the mold and give sharp true castings. If this cannot be done, only the rough cuts in machining the cutters are saved and the difficulty involved in cutting the scale may easily offset this gain. Third, that of producing a satisfactory structure to give great endurance and long life to the steel without the refining of the grain which is often considered to come only from the forging operation.

How Early Tests Were Made

A year or two ago some tools made by a direct casting process came into the hands of A. C. Davidson. It was soon ascertained that, for the reasons just stated, they could not compete with the older type of tools either in quality or price. Mr. Davidson had previously found that it was possible to kill steel much more completely than had hitherto been possible. He had also had a wide experience in the production of steels for different purposes and in their heat treatment. He believed that by the application of his process of killing the steel and his knowledge of heat treatment he could eliminate the defects in cast tools. He therefore began a long series of experiments for that purpose.

In April, 1918, the writer was retained to supervise a test of the process and see whether the claims made for it could be substantiated. Mr. Davidson had at that time no works of his own and it was necessary to hire a crucible furnace, which had at one time been used for making crucible castings but which had been out of use for some months. This furnace was of poor design and in a bad state of repair, but it was thought that it would serve for a demonstration heat. Ten 100-pound crucibles were accordingly charged under the inspection of the writer and put into the furnace. One of these was charged entirely with high-speed steel scrap, largely that resulting from previous melts made by Mr. Davidson. This was done with the object of proving whether or not the gates and risers resulting from the casting operation could be worked up in subsequent heats, since the losses that would result would destroy the value of the process if these had to be thrown away.

The furnace worked so badly that the heat instead of coming out in six

FIG. 4—SECTION OF CAST HIGH-SPEED STEEL, ETCHED IN 4 PER CENT NITAL SOLUTION FOR 30 SECONDS. X 100

hours, as it should, was in the furnace about nine to 10 hours and only three pots became hot enough to pour at all, the metal even from these being entirely too dull for the best results. After this number had been poured, the cover over the furnace flue collapsed and the heat had to be terminated. The conditions surrounding the test were therefore in every way unfavorable and disadvantageous. Nevertheless a number of milling cutters, countersinks for ship rivets, and forming tools were cast, some of the best of them coming from the pot charged entirely with scrap. Two of the cutters and one of the countersinks were taken from the works by the writer, etched with private identification marks, turned back to Mr. Davidson for annealing, machining, hardening, and grinding and were then returned by him to the writer for test. In order to have a fair standard of comparison, a well-known side milling cutter of one of the best brands of high-speed steel was bought directly from the works. The 6 x ¾-inch milling cutter contained a number of steam holes caused by wet molds. It was by no means a perfect casting, nevertheless it stood up favorably under the most extreme test that could be given it with the cutter.

A 2½ x 2½-inch side milling cutter was then put in the machine and tested at gradually increasing speeds until finally the limit of the machine was reached. The cutter was taking a depth cut like a keyseat in a bar of steel of 0.30 or 0.40 per cent carbon, this cut being the width of the cutter by ¼ inch deep. On the final test, the cutter was run at a speed of 400 revolutions per minute, with a feed of 7 inches per minute. This is a linear speed of about 250 feet per minute and, as stated, was the limit of the machine. The cut was run as far as the clamps on the test bar would permit, and as it was not possible to test the cutter any more severely, the test was stopped and the cutter taken out. It showed no sign of the gruelling test it has been through.

Features of "Killing" Process

In regard to the process of killing, which not only eliminates the blow-holes completely but seems to give the steel a fluidity far beyond that of ordinary high-speed steel, the writer is unable to speak. The material used for killing is a secret of which the writer has no knowledge whatever. It may be said, however, that the results are striking. The notable features are three: First, the extraordinary freedom from blow-holes; second, the fluidity of the metal; and third, the entire absence of coarse crystallization in the casting.

In regard to the first of these features, it may be stated that the foundry ran for several weeks before the completion of its baking oven,

FIG. 5—SECTION OF CAST HIGH-SPEED STEEL, ETCHED IN 5 PER CENT NITAL SOLUTION FOR 30 SECONDS. X 400

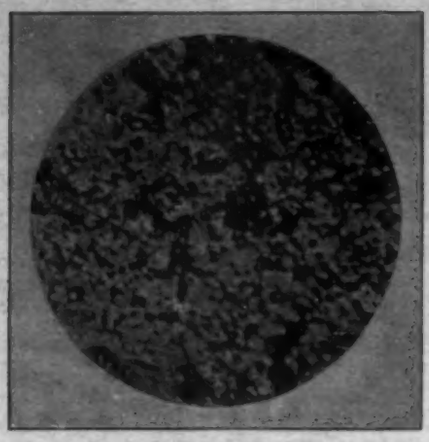


FIG. 6—SECTION OF A MILLING CUTTER, ETCHED IN 5 PER CENT NITAL SOLUTION FOR 7 MINUTES. X 100

pouring the steel largely into green-sand molds, and yet made satisfactory tools, there being only a few steam holes near the surface. Since the drying oven was put into operation, blow-holes of any description are practically unknown. In regard to the second, the metal, instead of having a comparatively ropey pour, is thin and fluid more like good hot cast iron than like steel. As a result the details of small cutters are cast practically perfect. In regard to the third feature, it is well known that most steel, when cast, has a coarsely crystalline or fiery structure, but an examination of the fresh fractures of this steel shows that this is almost wholly absent; in fact, the structure of this steel, as cast, looks more like that of forged steel than it does like a casting.

Photomicrographs, which were prepared by Sauveur & Boylston, Cambridge, Mass., reveal the microstructure of a first-class make of forged and machined high-speed steel, of a cutter made of an ordinary cast high-speed steel, and of a tool made by the Davidson process. With these are submitted a statement by H. M. Boylston, which is as follows:

"This was a piece about ¾ inch in section, showing a scale on all sides but one, which had evidently been cut. We prepared the cut surface and photomicrographs, Figs. 1 and 2, represent the structure respectively at 100 and 400 diameters. It will be seen that the structure is fairly fine for a casting and consists of a light matrix in which some polyhedral networks can be indistinctly seen, Fig. 2. Embedded in this matrix are three other constituents; one a dark mottled constituent resembling troosto-sorbite in ordinary carbon steel and resembling also the dark constituent in a cast high-speed steel of ordinary composition or of an ordinary high-speed steel after forging and annealing. The second constituent is a light hard one forming a herring-bone design and is plainly a eutectic of some sort. It is similar in quality but greater in quantity to the so-called carbide envelopes found in ordinary cast high-speed steel. The fourth constituent consists of a series of separate small rounded hard white spots similar to the excess carbide found in an ordinary high-speed steel both before and after hardening, provided the sum of the carbon, tungsten, and chromium contents are high enough. The structure of this sample is more like that of an ordinary high-speed steel casting than that of a well-treated high-speed steel after forging, annealing, and heat treatment, but it is also clearly different from the structure of an ordinary high-speed steel casting of good quality, in that the dark constituent of a sorbitic appearance is much less in quantity than in an ordinary high-speed steel casting, while the herring-bone eutectic is larger in quantity than is found in the carbide envelopes of an ordinary high-speed steel casting. The ordinary casting, also, does not contain the separate bright white constituents while the tool made by the Davidson process apparently has some austenite (the polyhedral grains dimly seen in places in Fig. 2).

"Photomicrographs of an ordinary commercial high-speed steel casting (from an ingot) magnified 100 and 400 diameters respectively are shown for comparison in Figs. 4 and 5.

"The structure of the commercial milling cutter submitted to us is that of a commercial high-speed steel with

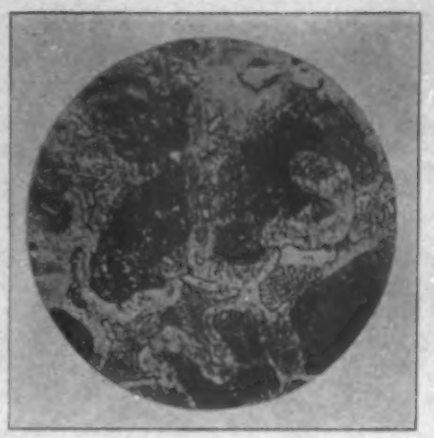


FIG. 7—SECTION OF A MILLING CUTTER, ETCHED IN 5 PER CENT NITAL SOLUTION FOR 7 MINUTES. X 400

an unusually large amount of free carbide forming almost complete envelopes in some cases. The background is austenite with some fine markings, which we judge to be due to the tempering process. The structure as a whole is different from the cutter made by the Davidson process but is characteristic of an ordinary high-speed steel forged cutter that has been heat treated and tempered. There is a dark constituent surrounding the free carbide areas in this sample, which would seem to indicate that the heating for hardening has either been too low or has been continued for too short a time, so that the annealed structure is not entirely obliterated. The fact that the networks of austenite are often incomplete and the large amount of free carbide present are additional evidence of this defective heat treatment. While we have called this defective heat treatment, it may not be a serious matter in a cutter of this size, although we should look for brittleness at the edges of the cutting teeth which are on the periphery.

Judging from the number of cases in which the cast tools have outstripped all others in such tests, a suggestion not unworthy of consideration is that the structure shown by the tools made by the Davidson process is that at which other toolmakers should aim.

Develops New Process for Case Hardening

BY JOSEPH W. RICHARDS

OF THE liquid melts used as baths in various case-hardening processes the most effective and most frequently used are melted potassium cyanide and melted sodium cyanide. These may be used either pure or mixed with salts that reduce the melting point and the percentage of cyanide present. The use of these baths since 1914 has met many commercial difficulties because of the high price and frequent commercial scarcity of the cyanide salts; at present sodium cyanide has practically entirely displaced potassium cyanide. Another trouble is the danger to the workmen handling the cyanide salts, which are extremely poisonous, and the annoying and poisonous vapors or gases given off in the workshop, unless an effective system of hoods and ventilation is provided, so as to prevent the gases from the baths mixing with the air of the room.

Porter W. Shimer, Easton, Pa., has invented a substitute for the bath of melted cyanides which case-hardens with equal or greater facility and effectiveness, gives off no poisonous vapors, and costs for chemicals but a fraction what the cyanide costs in the previously used baths. The process has been in use over a year in a large American works and the following statement embodies the re-

From a paper to be presented at a meeting of the American Institute of Mining Engineers, Feb. 17-20, New York. The author, Joseph W. Richards, is professor of metallurgy, Lehigh University, South Bethlehem, Pa.

sults of practical experience in the use and operation of the process.

The liquid or melted bath according to Mr. Shimer's process, consists of a mixture of easily fusible salts that do not possess case-hardening properties, into which is immersed fresh calcium cyanamide, which imparts to the bath case-hardening properties. The composition of the noncase-hardening salts appears rather immaterial. Good results have been obtained by using a mixture of sodium chloride, calcium chloride, and barium chloride in equal proportions by weight; also a mixture of one part sodium chloride to one part calcium chloride. Potassium chloride can replace the sodium chloride where the question of cost is not material, producing a liquid bath when equal chemical parts of the two salts are used; that is, 58.5 parts of sodium chloride to 75.5 parts of potassium chloride. Alkaline carbonates or alkaline hydroxides have also been added to the bath material with advantage in some special cases.

Controlling the Strength of Solution

The mixture of noncase-hardening salts is melted in an iron or steel pot suitable for case-hardening operations, and the calcium cyanamide is brought into contact with it, which may be accomplished in several ways. One effective method is to place small lumps of the cyanamide in an iron basket, which is sunk to the bottom of the case-hardening pot. A lively evolution of gas soon takes place, the exact composition of which has not yet been fully determined. The bath quickly acquires case-hardening properties, which last as long as the evolution of gas continues. What the exact chemical reaction of the cyanamide upon the noncase-hardening salts is, to produce a melt that has excellent case-hardening properties, has not yet been determined; it would need thorough and arduous chemical investigation to precisely illuminate the rationale of the operation. The fact remains, however, that contact of the cyanamide with the other salts imparts to the liquid bath active case-hardening properties.

In practice, the calcium cyanamide is immersed in the bath of melted salts and as soon as a lively evolution of gas is shown, the dipping in of articles and their case-hardening can be proceeded with. If the evolution of gase becomes too active, the cyanamide may be removed and case-hardening can be proceeded with for some time after this removal. When the case-hardening power of the bath decreases, the cyanamide may be reimmersed and the operation continued as before. If the cyanamide is in large fresh pieces and the evolution of gas is not too violent, the cyanamide may be left permanently in the bath until it has lost its power of imparting case-hardening properties to the melt, as is shown by the diminution of the evolution of gas. On removing this apparently exhausted material, the larger pieces may be broken, thus exposing fresh surfaces, and the material will be found to still retain active properties when reimmersed in the bath.

It has been found that the cyanamide is best used in lumps varying from the size of a walnut to the size of an egg. It should be in the fresh condition as it is taken from the furnace; that is, it should be kept hermetically sealed until used. If fine powder is put into the bath, it is difficult to keep the powder immersed, and the frothing is voluminous and troublesome. If the cyanamide has been exposed to air, absorbing moisture and becoming oxidized, it causes violent frothing when immersed in the bath, which continues an inconveniently long time. If only such cyanamide is available, it may be mixed with pulverized hard pitch or with tar, and the mass coked at a red heat; this eliminates absorbed moisture and changes the structure from powder to a porous coke. Such porous coke is then used in the melted salts in exactly the way that has been described for solid lumps of fresh calcium cyanamide. Arrangements have been made with the manufacturers of calcium cyanamide to select high-grade cyanamide for the purposes of this process, and to transfer it directly from the furnace in lumps of desired size to airtight containers, so that its use in the process will always be at a maximum efficiency.

The quantity of cyanamide immersed may vary according to the size of the bath and the shape, size, and character of the articles to be case-hardened. A bath may have immersed in it 5 per cent of its weight of the fresh calcium cyanamide, or a corresponding quantity of the cyanamide coke, for ordinary work. Upon removal from the bath, the case-hardened articles are quenched in a suitable cooling liquid.

A careful estimate of the relative cost of running with the sodium cyanide at normal market prices and calcium cyanamide as described, extending over more than a month's work in a large plant, shows the cost of the bath material to be approximately one-fifth as much when using calcium cyanamide as when using sodium cyanide, with the case-hardening done in an equally satisfactory manner, and with much more comfortable and healthful conditions to the workmen. The question of the scientific basis of the process is being investigated by the inventor.

Book Review

Official Proceeding of the Fifth National Foreign Trade Convention, compiled by O. K. Davis, secretary, National Foreign Trade Council, No. 1 Hanover square, New York; octavo; bound in buckram, with gold stamps; 600 pages; price $2, postpaid.

Commercial preparedness was the theme of the fifth national foreign trade convention, held at the Hotel Gibson, Cincinnati, April 18 to 20, 1918. This volume is a complete report of the proceedings of the convention, including all addresses, as well as a stenographic report of informal discussions and banquet speeches. Since the fifth convention was called to consider first, the part of foreign trade in winning the war and, second, problems to be solved in meeting after war conditions, the volume is of historical as well as practical interest. This is particularly true since the march of world events have thrown industry into a period of reconstruction which always follows war, the period anticipated at this meeting. Every factor of American foreign trade was treated at the meeting and now in the compilation, agricultural, industrial, commercial, financial and transportation. Every section of the country was represented by approximately 1000 delegates and numerous representatives of the nation's foreign trade were present from abroad. The volume represents the most comprehensive and authoritative statement of steps taken prior to the gathering and outlines the measures and policies proposed at the convention to secure the fullest accomplishment of those purposes. The scope of the influence of the National Foreign Trade council, of which James A. Farrell, president af the United States Steel Corp., New York, is chairman, is steadily increasing. Because of the extent to which foreign trade is entering into today's economics, the contents of this book are valuable as outlining what is necessary to enable American industry to take its proper place in the world's markets. Its appearance is timely. The sixth convention has been announced. It will be held at Chicago, at the Congress hotel, April 24, 25 and 26.

All potash produced in Alsace-Lorraine, will be needed by the French government, so that shipments of this mineral from France to the United States cannot be started until a decision as to the status of the mines has been reached.

Ferromanganese in Blast Furnaces

Concluding Installment of Bureau of Mines' Report on Investigation of 18 Blast Furnaces Producing Ferromanganese—Various Methods of Operation and Figures on Cost and Profits Are Given

BY P. H. ROYSTER

Of the various thermal reactions which take place in the blast furnace the two most important are: First, $C + O = CO + 4450$ (or 4950) B.t.u. per pound of C, at 1600 degrees Cent., and second, $CO_2 + C = 2CO + 5410$ (or 5900) B.t.u. per pound of C, at 850 to 1300 degrees Cent.

In the first reaction both the carbon and the oxygen are supposed to be at the temperature of the solid stock in the combustion zone. This temperature is probably 1550 degrees Cent. for the ferro furnace and 1590 degrees Cent. for the iron furnace. Subtracting from the total heat of the reaction sufficient heat to bring the blast in each case up to the temperature of the solid stock in the combustion zone gives a net heat to the gaseous product of reaction of 972 (or 1280) B.t.u. per pound of metal made for the iron furnace and of 3690 (or 4800) B.t.u. for the ferro furnace.

In the case of the ferro furnace either in the hearth, at the tuyeres, or just above them all the manganese in the metal was reduced from MnO. It is certain that all of the CO_2 resulting from this reduction is itself reduced by solid carbon to CO, and the carbon involved in this reaction is 0.218 pound of carbon per pound of metal, resulting in a loss of 1180 (or 1290) B.t.u., leaving 2500 to 3500 B.t.u. to be used in heating the ascending gas above the temperature of the solid stock. The ferro gas weighs 12.6 pounds per pound of metal and the iron gas weighs 4.2 pounds per pound of metal. The ferro gas has two to three times the heat available for raising the gas temperature and has just three times the weight of gas to be heated. The rise in temperature, therefore, is either the same or less in the ferro furnace than in the iron furnace.

It is unwise to go here into any detailed consideration of why it is necessary to heat the ascending gas to this definite but somewhat unknown elevation above the temperature of the descending stock. It may be pointed out, however, that some 250 tons of solid stock must be heated from 70 degrees Fahr. to above 2800 degrees Fahr. in 24 hours; that the greater part of this stock, being coke and mineral oxides, has a low thermal conductivity; that the ascending gas stream does not have a chance to flow around every separate piece of coke, stone, and ore; and that the transfer of heat from gas to solid is, under the most favorable conditions, a slow process. In order to heat the stock in the required time, therefore, the gases must at every point in the furnace be appreciably hotter than the stock; and this means not several degrees hotter but several hundred degrees hotter. Thus, the 4165 pounds of carbon burned at the tuyeres in the ferro furnace gives no greater temperature elevation to the gas stream than does the 1386 pounds burned in the iron furnace.

At five of the 18 furnaces where investigations were conducted on the production of ferromanganese in blast furnaces samples of downcomer gas were taken and analyses made for the CO and CO_2 contents. The results obtained were somewhat variable but indicated distinct tendency toward what might be called a normal composition.

In the matter of oxygen the evidence was that in the true furnace gas the oxygen content was nil. Actual values were, for well taken samples, 0.0 to 0.2 per cent. Where the conditions of sampling permitted the chance of contamination by the atmosphere, the O_2 content might be as high as 1 per cent. It was felt, however, that this amount of O_2 could be safely attributed to leakage of air into the sample.

The CO_2 content varied between the extreme limits of 11.6 and 3.5 per cent, with averages for the five furnaces of 6.7, 7.6, 7.1, 5.9 and 6 per cent. The CO content varied from 25 to 38 per cent, with averages for the five furnaces of 31.8, 34.2, 30.9, 30 and 31 per cent. The average analysis for the five furnaces was CO_2 6.67 per cent; CO 31.7 per cent.

Assuming that the H_2 and CH_4 content of the ferro gas is the same as that of the pig furnace and estimating N_2 by difference, the analysis by volume and weight of ferro gas is as follows:

	Per cent by volume.	Per cent by weight.
CO_2	6.67	10.44
CO	31.17	31.00
CH_4	.36	.17
H_2	31.6	.21
N_2	58.64	58.18

In Table III the weight of the furnace gas is calculated to be 31,647 pounds per ton of metal, which means, from the foregoing analysis, 3300 pounds of CO_2. The CO_2 from 2341 pounds of the stone is 968 pounds. The CO_2 resulting from the reduction of 190 pounds of Fe_2O_3 is 156 pounds. The CO_2 resulting from the reduction of 3770 pounds of MnO_2 to MnO by CO is 1885 pounds. The CO_2 from these three sources totals 3009 pounds. This indicates a 9.56 per cent content of CO_2 in the gas as against 10.44 per cent given in Table III. There is left over 291 pounds of CO_2 which may be the product of CO reduction of MnO in the lower part of the furnace, to carbon deposition from CO in the upper part of the furnace, or, more likely, to experimental error either in the analyses as such, or in the applicability of the analyses taken by the bureau of mines to the average practice given in Table I. The evidence points, in a remarkably close way, to a 100 per cent reduction of MnO "directly" by carbon.

Table IV

Relation of Carbon Fuel to Slag

Slag per ton Pounds	6410 Carbon per ton Pounds	Blast temperature °F.	Carbon reduced to blast temperature of 1130° F. Pounds
4728	6150	990	6224
3334	6150	1080	6083
2604	4830	1210	4936
2120	4550	1220	4670

From a report on the production of ferromanganese in blast furnaces, prepared by direction of the bureau of mines, department of the interior, in co-operation with the school of mines, University of Minnesota. This is the concluding installment of the report, which was begun in the Feb. 6 issue of The Iron Trade Review.

It is well to point out that "direct" reduction by carbon probably means nothing of the kind. As in most important metallurgical problems, no experiment yet made settles this question. It can be assumed that the reaction, $MnO + CO = Mn + CO_2$, is the reaction by which the final reduction of MnO takes place at a temperature somewhere between 1265 and, say, 1400 degrees Cent. At this temperature the following reaction takes place, almost to completion, and with great rapidity: $CO_2 + C = 2CO$. The result of the two reactions going on simultaneously, although not necessarily in the same part of the furnace, gives the same products of reaction as the reaction: $MnO + C = Mn + CO$. As the first and second together are not distinguishable from the third by any calculation based upon gas analysis, one must be content to assume that either of these two phenomena may be the one that takes place.

It is scientifically interesting to apply to the furnace records accepted metallurgical theory, but practically the important thing is to have at hand something definite in the way of a guide in burdening and driving the furnace. The following discussion, therefore, is based exclusively on the figures in Table I and is free from theoretical considerations. It is an attempt to establish from the whole mass of data certain relationships between the 23 items of each run. There are only three factors that the furnace operators can change at will: Ratio of coke and ore, ratio of stone and ore and wind blown per minute.

It is assumed that the blast temperature is kept as high as stove conditions permit. The number of rounds charged and the tons made per day are decided by the furnace itself. With the above three factors determined, there is nothing left for the operator to do but stand by and watch the coke burn.

Aside from the relatively constant amount of fuel needed to preheat, reduce and melt the metal, the carbon fuel required per ton of alloy should depend upon the temperature and humidity of the blast, the weight of the slag and the temperature maintained in the combustion zone and hearth. That is, there should exist a relationship between five variables. In an attempt to determine this relationship the first step must be to dismiss the question of humidity, not because it is an unimportant factor but because in the present case no information is available concerning it.

In the matter of hearth temperature, no direct measurements are at hand; the pyrometer observations made by the bureau's investigators covered too short a period to prove of material assistance at this stage of the investigation. In a general sense the silicon in the alloy may be regarded as a thermometer; but for a given hearth temperature the amount of silica reduced to silicon undoubtedly depends on a number of other factors including, probably, the composition of the slag and the speed of operation. The best indication of the temperature of the hearth is given by the amount of unreduced MnO in the slag.

The following procedure was adopted: The results of the 40 runs were arranged in order of decreasing slag weight and placed in four groups. The averages by groups appear in Table IV. The results were also arranged in the order of decreasing blast temperature, being again placed in four groups and the results averaged by groups. The averages are given in Table V. By the method of successive approximation it was found that one pound of extra slag requires 0.88 pound of carbon and that one degree Fahr. of extra blast temperature saves 1.33 pounds of carbon. Written in the form of an equation: $K = 4170 + 0.88\ V - 1.33\ T$, where K = pounds of carbon required per ton of alloy; V = pounds of slag required per ton of alloy, and T = blast temperature in degrees Fahr.

This equation shows, for a given slag weight, for a given blast temperature and for average humidity, the carbon required to heat the materials in the hearth to the average hearth temperature. As has been shown, this temperature is probably about 1550 degrees Cent., but it is better not to place too much confidence in this figure.

Determination of the percentage of manganese that goes into the slag is approached in the same manner as the problem of fuel requirements, with the exception that there must not be any "left over" variable such as excess carbon over requirements. The operator can at his own free will charge so little fuel that the hearth freezes; or he can charge so much fuel that he bankrupts the owners. The percentage of manganese in the slag, however, is the result of a number of metallurgical phenomena and is definitely determined by the actual furnace facts.

Actual furnace tests demonstrated that the percentage of manganese in the slag depended upon the following factors: The ratio of bases to silica in the slag; the hearth temperature as determined by the excess or deficiency of fuel above or below that indicated in the preceding equation; the rate of driving.

The expression found most nearly to represent the speed of operation was the pounds of gross slag produced per minute per square foot of hearth area. Gross slag here means the weight of slag-forming material, manganese being a slag-forming material. That is, the weight of slag that would be flushed

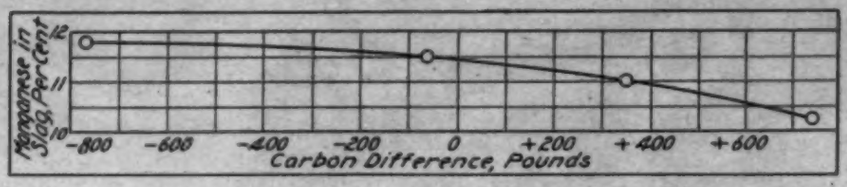


FIG. 1—CURVE SHOWING RELATION OF PERCENTAGE OF MANGANESE IN SLAG TO CARBON DIFFERENCE

Table V

Relation of Carbon Fuel to Temperature

Blast temperature °F.	Carbon per ton of alloy Pounds	Slag per ton of alloy Pounds	Carbon reduced to 3250 pounds of slag Pounds
1358	4670	2700	5160
1210	5160	3000	5380
1077	5680	3400	5530
862	6400	3900	5820

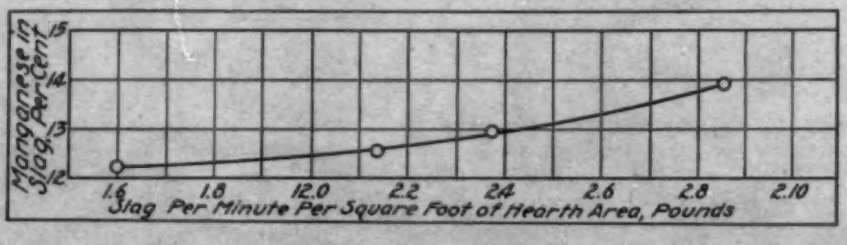


FIG. 2—CURVE SHOWING RELATION OF PERCENTAGE OF MANGANESE IN SLAG TO RATE OF DRIVING

Table VI

Manganese Lost in Stack

Group	1	2	3	4
Mn lost from stack, per cent	24.4	15.7	9.1	4.0
Top temperature, °F	904	851	905	904
Mn in slag, per cent	8.6	13.5	11.1	10.6
Si in metal, per cent	1.43	0.95	1.15	1.20
Ratio of base to silica	1.61	1.47	1.56	1.49
Rate of driving*	2.17	2.32	1.95	2.22
Carbon excess or deficiency, pounds	+253	—86	+32	—121

*Pounds of gross slag per minute per square foot of hearth area.

from the furnace if none of the manganese was recovered in the metal. There is an implication here, probably warranted, that the MnO_2 charged is reduced to MnO in the upper stack, but that the MnO entering the bosh is fused with the silica, alumina and bases, and that it is reduced to metallic manganese only after it has descended molten into the hearth. The calculation of the gross slag is simple. To take the figures from the average of the 40 runs represented in Table I as an example the slag weight is 3196 pounds. The metallic manganese in the metal is 1680 pounds. The metal was reduced from 2170 pounds of MnO. The gross slag was therefore 3196 + 2170, or 5366 pounds per ton of metal.

It is well to notice that the more usual expression for speed of operation in blast-furnace parlance is the pounds of carbon burned per minute per square foot of hearth area. Without commenting upon this point of view as it applies to the iron furnace, its applicability to the manganese furnace is extremely doubtful. The only factor limiting the speed of operation, assuming that the speed is not so great that the stock is blown out the top of the furnace, is the ability of the hearth to reduce manganese from the slag. As long as the hearth temperature is above 1265 degrees Cent., all the manganese in the slag should be reduced, provided the slag remains for a sufficient length of time in the hearth under the reducing influence of a CO atmosphere and in contact with solid carbon. Therefore, no principle of common sense is violated in taking as the criterion of speed the figure for the pounds of slag passing into the hearth from the bosh per minute per square foot of hearth area.

The results of the 40 runs represented in Table I were grouped in order of decreasing "excess carbon" as determined by the preceding equation. The results were then divided into four groups and the average recorded as in Fig. 1. The results, when arranged in the order of decreasing basicity, ratio of bases to silica, grouped and averaged, are shown in Fig. 2. In the same way Fig. 3 gives the averages for groups taken in order of decreasing rate of driving.

In deriving an equation for the percentage of manganese in slag four quantities are involved. If only figures could be selected wherein two of the quantities varied while the other two quantities remained constant the derivation of the equation would be direct and simple. Unfortunately this is not true. Thus, in Fig. 1, there is shown to be a distinctly apparent relation between carbon excess or deficiency, basicity and rate. As the carbon decreases the basicity decreases and the rate of driving increases. This relationship is due to the management of the furnace. The increase of basicity is governed by the stone charged; the carbon excess, or deficiency, by the coke charged; and the rate of driving by the speed of the engines. For any run the stone can be decreased, the coke increased, and the engines slowed down by practically any arbitrary amount, and the furnace will still continue to make ferromanganese, although it may not make money. That this apparent relationship exists between carbon excess or deficiency, basicity and speed shows only that the furnace operator follows, perhaps unknowingly, a definite rule in burdening and driving the furnaces.

Although in Figs. 1, 2 and 3 all the four quantities concerned vary it is found by successive approximation that an excess of 100 pounds of carbon lowers the manganese in the slag 0.11 per cent; that an increase in the rate of driving of one pound per square foot of hearth area increase the manganese in the slag 1.34 per cent, and that an increase in the ratio of base to silica of one unit decreases the manganese in the slag 9.16 per cent.

No general principles can be given relating to the burdening of the furnace, as the most important considerations governing the problem are the cost of the materials used, the daily payroll, and the furnace overhead. Every change in the burdening and driving factors cuts both ways. Slow driving reduces slag loss and runs up labor and overhead. Increasing the proportion of lime in the slag within reasonable limits results in lowering the slag loss, but increases coke consumption, and cuts down tonnage, resulting in lower ore cost, higher fuel cost, and increased labor and overhead charges. Using excess coke results in a slight decrease in the percentage of manganese in the slag, but in general increases the slag weight more rapidly, so that the slag loss, being the product of the slag weight and the percentage of manganese in the slag, is increased.

About the only general criticism that can be made of the burdening and driving data is that there is on the whole a tendency to use too much fuel and to drive too slowly. The saving of ore resulting from slow driving, while

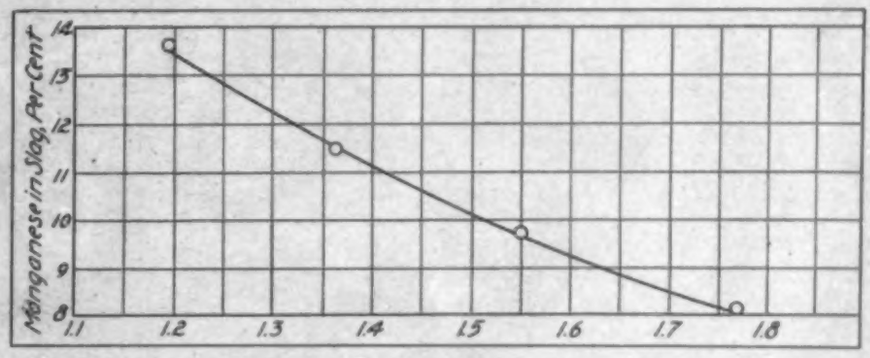


FIG. 3—CURVE SHOWING RELATION OF PERCENTAGE OF MANGANESE IN SLAG TO RATIO $(Ca + MgO) : (SiO_2)$

Table VII

Analysis of Charge

Material	Weight, pounds	SiO_2 Per cent	SiO_2 pounds	Al_2O_3 Per cent	Al_2O_3 pounds	Bases Per cent	Bases pounds	Mn Per cent	Mn pounds	Fe Per cent	Fe pounds	C Per cent	C pounds
Ore	5310	8.60	457	2.50	133	...	....	40.33	2240	5.93	325	....	....
Coke	4000	2.74	109	2.47	98	...	....	....	....	...	...	90.95	3636
Stone	2102	.42	10	0.13	3	53.0	1114	....	....	...	...	....	....
Total	....	...	576	...	234	...	1114	....	2240	...	325	....	3636

Table VIII

Summary of Cost and Profit

Charge	Ore, 5310 pounds, 2.48 tons @ $40	$99.38
	Coke, 4000 pounds, 2.00 tons @ 10	20.00
	Stone, 2102 pounds, 0.94 tons @ 3	2.82
Cost of materials		122.20
Daily labor and fixed charges $775.		
Charge against one ton of metal @ 77.5 tons per day		10.00
Total furnace cost of one ton of metal		132.20
Selling price, $250 for 70 per cent ferro, with $3.50 per unit, bonus and penalty.		
Selling price of one ton of ferro containing 79 per cent Mn		281.50
Furnace profit per ton		149.30
Furnace profit per day @ 77.5 tons per day		11,570.76
Furnace profit per day of furnaces represented in Table I		5,323.00
Gain in profits due to improved materials and practice		6,247.76

appreciable, causes a considerable loss in profits of the furnace and, although in line with conservation of materials, will not appeal to the operator who is to pay the labor and overhead charges.

It may be stated that the most effective methods of reducing the slag loss of manganese are: The use of low-ash coke and of low-silicon stone, and carrying as basic a slag as is practicable.

The sum of the manganese in the slag and that in the metal does not equal that charged into the furnace. The percentage of manganese in the charge not accounted for by the manganese carried from the hearth is for convenience called stack loss. The value of this quantity in Table I varies from 0.8 to 32.1 per cent. Its average is 12.8 per cent. As the average loss of manganese in the slag is only 14.7 per cent, the stack loss is as important as the slag loss. It is a quantity, however, that has not thus far proved itself susceptible to analysis or definite explanation. It may be due to: Volatilization of metallic manganese from the hearth; volatilization of manganese oxide in the hearth or stack; manganese oxide carried off as ore fines in a purely mechanical way by the blast, or it may be a fictitious result due to error in chemical analyses and weights.

To a certain extent in any individual case the apparent stack loss is surely a combined result of these four causes. But for the 40 runs taken as a whole it is difficult to understand how errors in weights and analyses would give a *loss* in 39 cases, instead of giving for one-half of the runs a *gain* of manganese in the stack. Unless it can be shown that the analyses for manganese in the ore are systematically high or those for manganese in the slag and metal are systematically low, it must be concluded that the errors are sufficiently eliminated in the average of a number of runs. There is a possibility that the loss as ore fines carried out mechanically by the blast may account for the whole loss.

Stack Loss Computed

The operating data from nine iron furnace plants indicates that 9.6 per cent of the iron charged is not accounted for by the iron in the slag and metal. This figure is surprising and while it does not inspire much confidence it is given here for the sake of comparison. As to the loss by volatilization, it probably is not important practically to distinguish between volatilization of metallic manganese and volatilization of manganese oxide. The answer to this problem will appear doubtless, when the relation is found between stack loss and some other operating quantity. If it is a volatilization phenomenon it should increase with a rise in hearth temperature. It should also decrease with any increase in the speed of operation, as the longer a given pound of slag or metal remains in the hearth the greater the volatilization.

The 40 runs in Table I were arranged in the order of decreasing stack loss and divided into four groups. The average for each of the four groups appears in Table VI. The results presented in the latter table show a manganese loss for each group of runs, but no systematic variation of stack loss with any other probably related quantity can be seen. High hearth temperatures as indicated either by high-silicon metal, excess carbon, basic slag, or low percentage of manganese in the slag appear not to affect the amount of stack loss. However, there is one practical conclusion to be formed, the furnace man must admit that the stack loss is a physical constant of sorts, and should operate his furnace on that assumption, or he must conclude that the data here presented are insufficient to permit a solution of the problem, and obtain for himself more complete and exact furnace records.

To illustrate the use of calculations suggested in this report, to indicate how many factors are involved in the simplest detail of furnace practice, and to serve as an introduction to the operating problem, a brief outline of the factors involved in the selection of coke and stone follows.

For the sake of comparison, a computation of the approximate furnace costs for the average run represented in Table I, apart from investment charges, may be interesting. The average charge per ton of metal is 2.67 tons of ore, 3.16 tons of coke, and 1.03 tons of stone. At the arbitrarily charged prices of $40, $10 and $3 per ton, f.o.b. furnace, the materials cost $149.49 per ton of metal made. The following daily charges are taken: Six hundred dollars for labor, and $175 for the aggregate of superintendence, chemical laboratory and reserve for relining, repairs, liability insurance, clerical work, demurrage, supplies, etc. Thus there is a total fixed charge of $775 against a daily production of 51.7 tons of ferromanganese, or a charge of $14.75 per ton. Hence the total cost per ton is $164.24. The selling price on 74.9 per cent ferromanganese is taken to be $267.15, so that the profit per ton is $102.71, or $5323 per day.

The following analyses of coke used in certain iron furnaces are taken from furnace records, and although the coke represented is perhaps not typical of that used in average practice, it is not abnormal, as millions of tons of such coke have been used annually at certain iron furnaces for years:

Sample No.	SiO_2	Al_2O_3	Fixed carbon	Volatile matter	Sulphur	Moisture
1...	2.74	2.47	90.95	0.79	0.41	1.35
2...	1.80	2.70	91.12	.47	.44	1.52
3...	3.06	2.43	91.06	1.16	.80	1.40

Let it be assumed that coke of a character as shown in the first sample is available for a ferro campaign and the stone of grade A, as described in

Table IX

Results With Two Grades of Stone

Constituent of charge	Stone A: Quantity per ton of alloy, Tons	Stone A: Cost	Stone B: Quantity per ton of alloy, Tons	Stone B: Cost
Ore	2.64	$105.56	2.72	$108.80
Coke	3.12	31.15	3.54	35.45
Stone	1.05	3.15	1.70	5.09
Total		$139.86		$149.34
Manganese in metal, per cent	75.6		72.15	
Slag per ton of alloy, pounds	2.890		3,839	

the section following relating to the selection of stone, is also available. Let the ore have the average analysis given in Toble I. Then it is possible to construct a charge sheet for these materials to give approximately the maximum daily profits, subject to the limitation that none of the operating quantities shall lie appreciably beyond what has been tried out as shown by Table I. The charge will be then as shown in Table VII.

The manganese balance, therefore, will be as follows:

Charged	2340
Average stack loss (12.66%)	284
Slag loss (8.43%)	189
To metal (79.00%)	1767
Accounted for	2240

The weight of the slag will be 2167 pounds, the analysis of the slag being as follows:

Constituent	Per cent	Pounds
SiO_2	26.05	*561
Al_2O_3	10.85	234
Bases	51.75	1114
MnO	11.30	241
S	.....	17
Total	....	2167

*15.1 pounds to silicon in metal.

The percentage of manganese in the slag was calculated to be as follows:

	Per cent
Average in Table I	10.60
Increase due to low fuel	.87
Increase due to fast driving	.75
Decrease due to high basicity	3.75
Manganese in the slag	8.57
Slag loss (slag weight times percentage of manganese in slag: 2167 x 8.75).	189 pounds
Slag loss in percentage of manganese charged	8.43 per cent

Relation of Coke to Cost

A complete summary of the operating cost, selling price and profit is given in Table VIII, The figures are disturbing, and yet it is difficult to see just where they are wrong. The matter is important. If the 11 furnaces represented in Table I had operated on this average practice the possible saving would have been $2,061,760.80 per year per furnace, or, for the 11 furnaces $22,679,368.80. The practical problem would have been to obtain the high-grade coke and stone involved. A peculiar point in the situation is that the iron furnace using the coke best adapted for the production of ferromanganese, namely that designated as the second sample in the preceding analysis, used stone with 3.36 per cent SiO_2, to increase the slag volume, and yet made metal of the following composition: Si, 1.52 per cent; S, 0.049; P, 0.173.

With the phosphorus content indicated, the metal is neither foundry nor bessemer grade. As basic pig, 1.52 silicon is objectionably high, unless a better sulphur content than 0.049 can be attained. The answer is that the coke used was lower in SiO_2 than was really desirable. A good coke consumption and a fair tonnage can be shown with low-silicon coke and stone, but in basic practice where the logical function of the blast furnace is to keep down the sulphur and the silicon, the slag volume should not be so low that it cannot take care of the sulphur.

Undoubtedly the operator of the basic furnace above mentioned realized this. Enough commercial pressure would have made him release this coke. If the ferro furnace had paid $20 per ton for low-silica coke, the daily profit would still have been $10,000 per furnace, an improvement of $4523 per day, or roughly 100 per cent. If the desired quality of coke could have been procured for $20 per ton and if the other assumptions are correct, the increased profit for any one furnace would have been $1,800,000 per annum.

Selection of Stone

As a typical problem relating to the selection of stone for use in furnaces producing ferromanganese, two grades of stone may be assumed to be under consideration. One may be designated grade A, consisting of 53 per cent basic constituents and 0.42 per cent silica; the other may be designated grade B, consisting of 49.5 per cent basic constituents and 7 per cent silica. Stone of grade A has been used in great quantities at one iron furnace and hence is not of purely hypothetical composition. Stone of grade B has been used in producing ferromanganese. If all the values, except for the grades of stone, be taken as for the average run represented in Table I, a comparison of results can be made as shown in Table IX.

The foregoing data are based on the assumption that the slag has a constant basicity ratio of 1.48 and that an increase of 1 pound in the rate of slag formation requires an increase in carbon of 0.88 pound.

The gross slag produced per ton of metal when stone A is used is 5150 pounds, and 5970 pounds when stone B is used. If the rate of driving be assumed to be constant, the tonnages will be 51.7 tons with stone A and 44.65 tons with stone B. The daily fixed charges will be roughly the same for both. There will, therefore, be a charge of $14.90 against a ton of metal if stone A be used and a charge of $17.35 if stone B be used.

The total costs are $154.61 and $166.66 per ton of alloy. The selling prices are $269.60 and $257.53; the profit per ton, therefore, when stone A is used is $114.99, and when stone B is used, $90.87. The profits per day are $5950 and $4060. Thus, the daily loss in furnace profits when stone B is used is $1890. This loss must be charged to the 75 tons of B stone used per day. Every ton of this stone, therefore, costs the furnace $25.20. Were the grade B stone obtained free of charge, the furnace loss for its use would be $22.50 per ton. Therefore, if stone A could be purchased at some premium less than $22.20 per ton, a furnace having no choice other than buying A or B would profit by the purchase of A. Such computations as these could be widely extended showing the actual premiums and penalties for coke and ore as based on the cost to the furnace, but the above example will suffice here to substantiate the following conclusions:

The blast-furnace superintendent should know at all times the cost and the analyses of all materials purchased, and should also be familiar with all purchasable materials even including $40 coke and $20 stone.

The decision as to the purchase of raw material should be left to the furnace superintendent, who should be in complete charge of the operation of the furnace.

Far greater saving in furnace profits can be attained from judicious selection of raw materials than from any changes in operating conditions.

As the market price of the alloy falls as it doubtless will, and the costs of stone, coke, ore and labor readjust themselves, it is only by a continued revision of some such calculations as the above, covering the coke and stone, that the furnace can hope to make its best showing.

Tinless Bearing Metal

A patent on a tinless phosphor-bronze bearing metal has been granted to W. D. Berry, president of the Berry Metal Co., New Brighton, Pa. The new alloy is being used by the Berry company. While bearing metals without tin have been used heretofore, they generally have been considered as suited primarily to light work. The new alloy, however, is proposed for rolling mills and locomotives. An addition to the company's buildings is planned.

During 1918 the production of quicksilver in the United States, amounted to 33,432 flasks of 75 pounds each, according to figures compiled by F. L. Ransome of the United States geological survey. This production was valued at about $3,942,301 and compared with the 1917 output, shows a decrease of 2727 flasks in quantity and an increase of $134,035 in value.

In Italy's Largest Metal-Working Plant

"Italy will soon be a great industrial force," said the Italian minister of finance, Signor Nitti, at the conclusion of the war. He based his prediction on the accomplishments of the country's industries during the struggle and the evident determination of the people to make greater use of their raw materials. The government has appointed a commission to aid the manufacturers, while the Ansaldo interests have begun a public campaign to increase their capital to $100,000,000.

The Ansaldo Company, Italy's greatest metallurgical industry, made iron and steel, guns, battleships, locomotives, motors and tractors during the war. A number of independent plants were absorbed. The company's naval gun factory is shown in the illustrations above, while at the left are the annealing furnaces, one of the 8000-ton hydraulic presses, and an element for a 15-inch gun in process of tempering. Below at the left is a 10,000-ton hydraulic press, and, at the right is shown the forging of an element for a 15-inch gun.

Cut Metal Trade's Disability Costs

Old Method of Compensation Insurance for the Disabled in Industry Superinducing Idleness is Being Supplanted—Handicapped Are Now Re-educated for Other Jobs—Red Cross Institute Operates Successfully

BY DOUGLAS C. McMURTRIE

IN the past, the chief method of dealing with men permanently disabled in industry has been to pay the worker a pension in the form of compensation, and forget him and his injury. However the cost of disability in the metal trades has not been alone in the premiums paid for casualty insurance. A large item of cost has been involved in the training experience and adaptation of a skilled worker who does not return to his job, and the fitting of a newcomer to take his place.

Three means of reducing and approaching the complete elimination of the cost of disability are: Accident prevention; thorough medical attention to minimize the disability resulting from the injury, and salvage of the remaining abilities of the worker through rehabilitation for self-support. The first of these has already received wide attention from employers and has wisely been encouraged in a financial way by casualty insurance companies and state funds. The values of the two latter have, however, not as yet been appreciated. Their energetic application would effect a tremendous saving to industry.

Many injuries from which men would completely recover in a short time under adequate and high grade medical attention are treated for an insufficient time, or by incompetent physicians. Instead of a prompt return to work, the case at best drags along over an extended period and at worst becomes chronic or develops into permanent disability. Some states require the insurance carrier to provide but two weeks of compulsory free medical attention to the injured man. For the insurance company to take advantage of this limitation is the most short sighted policy possible, because for every dollar saved in physicians' or hospital fees, the insurance carrier pays out later $10 in compensation. And what the insurance company expends is actually paid by the insuring employers in their regular premiums.

Unlimited medical attention of the highest grade should be an axiom of casualty practice. It should be insisted upon by employer and workman alike. The best outcome of any injury is to have the employe return to his job as a well man in the shortest possible time. It is well to develop a science of dealing with cripples.

The third method of attack on the cost of disability is rehabilitation for self-support or the re-education of an injured man for an occupation which he can follow, or a process which he can perform, in spite of his handicap. The science of rehabilitation is new, and the experience in it has practically all been gained in the effort to make sound and just provision for the disabled soldier or sailor. Every country among the recent billigerents is today operating a comprehensive system of re-education for disabled soldiers, and is placing upon that system more dependence than upon the pension system.

Pension System Unconstructive

Paying a man a small monthly or weekly stipend on which he is expected to live in idleness is by no means a constructive method. With the breakdown of confidence in the pension system, it was realized that the only real compensation for disablement was restoration of capacity for self-support. It further was realized that few jobs require all the physical faculties and that in today's variety of industrial processes, it is possible to find a job in which a man with a given type of disability can function 100 per cent efficient. Some jobs can be performed while standing, others while seated. Others require walking about. Some jobs at a bench working on small articles require but little strength; others involve great physical exertion. Still others do not require the sense of hearing, in others the sense of sight is not essential. Finding the future work of the disabled man, therefore, requires expert and painstaking choice, but a successful selection is possible even for the seriously handicapped. The first aim is to place the man back in a different job in his own trade or in a trade closely related. In such a job his past experience will stand him in good stead. Failing in this, he can be retrained for a different line.

The process of retraining the disabled is known as re-education, and can best be provided in a special school for crippled men. The first school of this kind in the United States is the Red Cross Institute for Crippled and Disabled Men, established in New York City through the generosity of Jeremiah Milbank. At this school, open to disabled civilians and soldiers alike, six trades already are being taught. These are artificial limb manufacture, motion picture operation, oxy-acetylene welding, printing, jewelry work, and mechanical drafting. More will be added as the demand develops. Many graduates are already giving satisfaction in the jobs to which they have been assigned, so the enterprise has passed the experimental stage.

The cost of soldier rehabilitation is being met by the United States government and by the government of some of our allies. It will be admitted without argument as desirable that the advantages of re-education be made available to disabled civilians as well, but will not the cost be prohibitive? The fact is that rehabilitation effects a reduction rather than an increase in the cost of disability to industry or to the community as a whole.

A typical case will illustrate how the saving is effected. A worker in Massachusetts was injured by a fall while working inside a submarine and his hand became permanently crippled. In due course his compensation rate was determined and he was referred to the insurance carrier to be paid $10 a week for a long period, with a maximum total payment of $4000. Since the disability was manifestly permanent the insurance company wrote the case off their books as a $4000 loss and transferred that amount to reserve to cover the weekly payments. After the compensation had been paid for nearly a year, a new official of the insurance company began looking over the list of men to whom the company was paying compensation. His attention was directed to the man in question and the latter was requested to call at the office of

The author of this article is director of the American Red Cross Institute for Crippled and Disabled Men, Twenty-third street and Broadway, New York.

the company. The case was like many thousands of others susceptible of rehabilitation for self-support, so the insurance company official put a proposition to the man in very frank terms. "I believe that you can be trained to earn a good living. I want you to understand clearly, however, that this proposal is to the financial advantage of the company, but I also believe it is to your advantage as well. A total income of $10 a week is not very attractive to you and you would probably rather return to work at a good wage than remain idle. If you will consent, the company will send you to a school of re-education and see if we cannot get you back on your feet in good shape. You can choose any profession you like."

The injured man consented to the proposal and the company sent him to the Red Cross institute in New York. They began to pay him not $10 a week as required by law; but $40 a week, $20 to him in New York and $20 to his wife at home. The company also paid liberally his traveling expenses in both directions. In the period of eight weeks he was re-educated in oxy-acetylene cutting and welding and returned home. He is now making not only a satisfactory wage but twice as much as he had ever earned before the accident took place.

In the whole transaction every party at interest was benefited. The man was advantaged in that his general living standard was distinctly raised, and the necessity of working for his living could not be considered as a hardship. The company paid less than $500 for his rehabilitation and this expense in conjunction with the $500 already paid in weekly compensation during the first year of idleness made a total for the case of $1000. They were thus enabled to charge $3000 of profit to the account of profit and loss. The community was infinitely the gainer in that the man, formerly an unproductive consumer, became a useful producer instead. The community further gained in the elimination of the disabled man from the category of a prospective dependent, because while compensation might have taken care of him in a very insufficient way during the period of idleness, there would have come a time when the compensation would end. Then he would have been in a desperate economic status indeed, confirmed in habits of idleness, untrained for skilled work, and without any source of support.

A more intelligent handling of disability by insurance carriers will, therefore, reduce their expense, and will thus cut the cost of casualty protection to the employer. There is needed also, however, some revision of compensation laws so that there may be definite encouragement to insurance carriers to offer opportunity of rehabilitation and definite encouragement to the disabled men to take advantage of it. Practically every compensation case that has ever come to the Red Cross institute has come on the day his compensation expired. For one year, for two years, or for four years the man has existed in idleness, drawing compensation, and cultivating habits of indolence. When his support was cut off, he then became interested in rehabilitation. Present compensation legislation tends to encourage the man to remain idle because his payments are reduced by any improvement in earning capacity. A revision of this practice will make for more constructive provision.

In short, the first effort should be to prevent injury, the second to minimize its permanent effects, the third, when disability has ensued, to offset its economic consequences. The execution of this complete program is not only sound humanitarian practice, it is good business as well.

Furnace Bung Distributes Blast Evenly

FOR the purpose of effecting a more uniform distribution of air on the metal bath of malleable iron and other air furnaces, the bung shown in the accompanying illustrations, was devised by William S. Robinson, superintendent of the Benton Harbor Malleable Foundry Co., Benton Harbor, Mich., to whom a patent also recently was issued covering this device. The bung frame which is similar in construction to bung frames generally employed, is provided with an air cylinder as shown in Fig. 1, that is cast the full length of the top of the bung. This cylinder is closed entirely at one end but at the opposite end an opening is provided for the air blast. Slotted bricks are inserted in the bung to effect the uniform distribution of the air blast across the entire width of the furnace, as shown at *B*, Fig. 2. In the event of brick falling out, the entire bung can be replaced just as readily as any other bung in the furnace and this may be accomplished without working over the top of the furnace.

This type of bung has been used at the plant of the Benton Harbor Malleable Foundry Co. for about a year and according to carefully compiled records, it has effected a saving of from 10 to 25 per cent in fire brick and economies

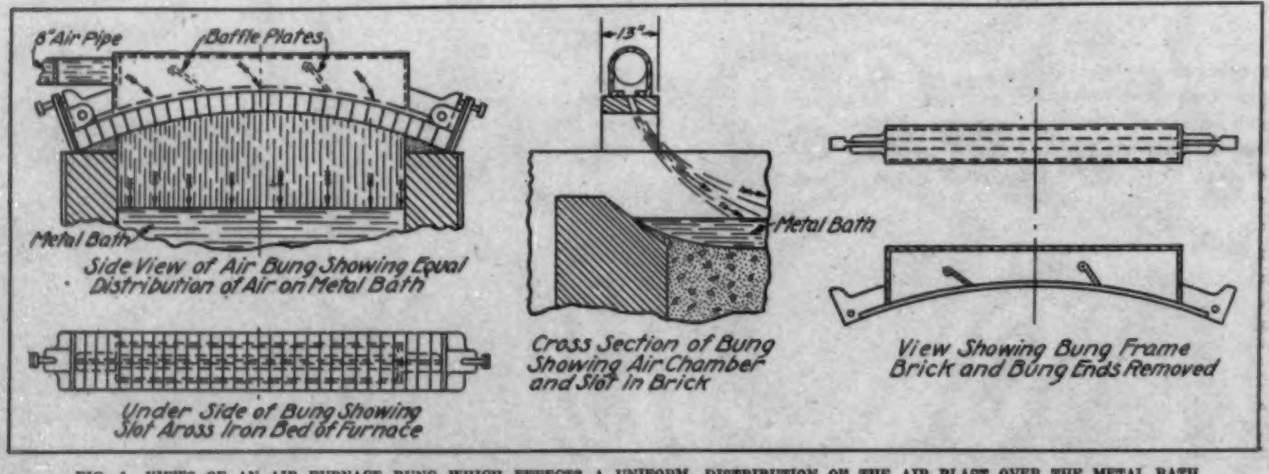

6" Air Pipe
Baffle Plates
Metal Bath
Side View of Air Bung Showing Equal Distribution of Air on Metal Bath
Under Side of Bung Showing Slot Across Iron Bed of Furnace
13"
Metal Bath
Cross Section of Bung Showing Air Chamber and Slot in Brick
View Showing Bung Frame Brick and Bung Ends Removed

FIG. 1—VIEWS OF AN AIR FURNACE BUNG WHICH EFFECTS A UNIFORM DISTRIBUTION OF THE AIR BLAST OVER THE METAL BATH

in coal consumption of about the same amount. The saving in fuel is claimed to be due to the improved combustion and better distribution of the air. Also, the time of melting has been reduced from 30 to 40 minutes and the iron so made is of a higher temperature than can otherwise be obtained. The bung shown at *A*, Fig. 2, has been used for 83 heats and while it was installed in the furnace 1400 tons of iron were melted. In addition to the economies effected in the bung brick, it has been found that the entire roof of the furnace gives a longer life and the side walls are capable of making an increased number of heats by the use of this type of bung.

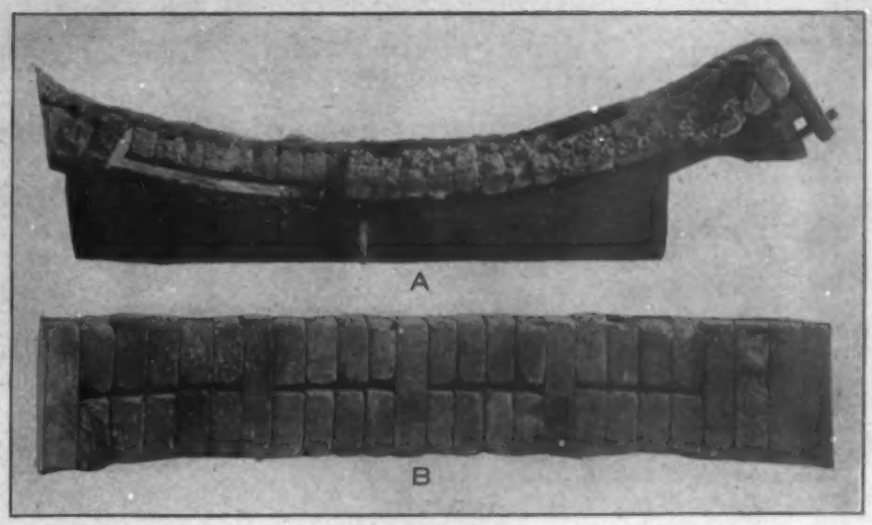


FIG. 2—A FURNACE BUNG THAT HAS A RECORD OF 83 HEATS IS ILLUSTRATED AT A AND B SHOWING THE ARRANGEMENT OF THE BRICK WITH SLOTS FOR THE PASSAGE OF THE AIR BLAST

Letter Eulogizes Work of Loyal Employes

"In connection with our heroic Allies, who have stood the brunt of an inexcusable and terrible war for so long, we have achieved a glorious victory, and while peace has not yet been ratified by treaty among nations, an armistice has been signed on a basis that would seem to destroy for all time the menace to civilization which is inevitable in a military monarchy. All of the employes of this company contributed in both service and in money to this success and we have with reason felt proud of the response our employes have made to each appeal of the government. Many of our associates entered the military service of the government and some of them made the supreme sacrifice in the most glorious cause for which men have been asked to give their lives for the good of humanity. We shall always remember them with pride and a deep sense of gratitude and the company hopes to establish an appropriate permanent memorial for each man who entered the service from the company's employ and particularly for those who gave their lives to their country. We want this sincere expression of our appreciation to reach every loyal employe of our company, in the furnace department, steel plants, rolling mills and offices, for we realize that the past year has been a most difficult one in every department and every employe who has been faithful to his duty has rendered a service to his country just as surely as if he or she has worn the uniform and a service just as necessary and important. The difficulties of returning to a peace basis will be very great but the management feels entire confidence that all of the employes of this company will, in the future no matter how great the difficulty, show the same intelligent co-operation as in past.

"To our managers, superintendents, and foremen we want to in an especial way express our appreciation for the fidelity, intelligence and successful efforts which have been so marked in spite of the unusual difficulties which have confronted them during the year just closing."

This is the gist of a letter by Severn P. Ker, of the Sharon Steel Hoop Co., Sharon, Pa., to the company's employes, which is published as a frontispiece of an illustrated war calendar, presented by the company to its employes recently. The calendar takes the place of the annual safety bulletin. It contains illustrations of all the allied leaders and of the Yanks, British, French, Italians and Servians in action.

Early History of Steam Turbine Engineering

The Westinghouse Electric & Mfg. Co. has just issued a circular, No. 1591, entitled "An Historical Review of Steam Progress." This publication was written by Francis Hodgkinson, whose commercial and engineering knowledge of the steam turbine is perhaps as broad as that of any man in America. The circular is a reprint of an article which appeared serially and is now gathered together in one publication with the idea of making it a handbook on steam turbine progress.

The early history of steam turbine engineering is gone into and the earlier machines installed in America are illustrated. From 1899 until 1917, each year's development is properly recorded as it occurred and the improvements are noted. The booklet is profusely illustrated with views of all the different types of impulse and reaction turbines and the construction of blading, valve chambers, governors, throttle valves, couplings and oil coolers are shown in detail. This publication should be valuable to designing and consulting engineers. It is being used extensively in government training classes for junior engineers on steam engineering work.

Trade Door to Alsace-Lorraine Opened

According to a recent announcement of the war trade board all persons in the United States are now able, subject to the rules and regulations of the board, to carry on trade and communication with persons residing in the states of Alsace and Lorraine. In accordance with this authorization, export and import licenses will be issued by the board. Individual licenses will not be required for the exportation of articles not on the export conservation list, as such commodities may now be shipped under special license No. RAC-63, which authorizes exportation of articles of this description to the United Kingdom, France, Italy and Japan. In all cases the general rules applying to the issuance of licenses to other friendly European powers will apply to Alsace-Lorraine.

According to a recent report, published in *Commerce Reports*, Consul General Hurst recently cabled from Barcelona, Spain, that the Spanish government has published detailed conditions for bids on concessions to work the potash beds of Catalonia. The bids will be received from Spanish and foreign companies until Feb. 14, at the Institute Geologico de Espana, Madrid.

Checking Up on Cottrell Process

Results Obtained in Electrical Precipitation of Impurities from Blast Furnace Gases Described—Method Adaptable to Spiegeleisen and Ferromanganese Furnaces—An Aid in Reclaiming By-Products

BY N. H. GELLERT

RECENTLY, the writer made an examination of a blast furnace plant manufacturing spiegeleisen and ferromanganese with a view to solving the problem of eliminating impurities from the gases. The examination developed the fact that the amount of dust given off by spiegeleisen and ferromanganese furnaces is far in excess of that given off by iron furnaces. An opportunity was presented to compare the results obtained when the furnaces were manufacturing pig iron, spiegeleisen and ferromanganese and they indicated that electrical precipitation is able to cope with the situation, no matter what is manufactured in the furnace.

The degree of cleanliness secured is not directly determined by the amount of dust present in the original gas. Preliminary examinations made on furnaces manufacturing spiegeleisen showed that an average of 4.143 grains of dust per cubic foot of gas at 32 degrees Fahr., were contained in the gas as it came through the downcomer. The dry dust catchers were able to eliminate half of this dust and measurements made beyond the dust catchers showed that 2.05 grains of dust per cubic foot of gas at 32 degrees Fahr. were contained in the gases.

Removing Fume and Fine Dust

The examination of the dust left behind in the dust catcher gave conclusive proof that practically none of what is commonly termed fume was collected, and little of the fine dust. This was to be expected. The dust catchers, by impingement, by the change of direction, or by decreased velocity of the gases dropped the heavy particles to the bottom. When it is realized that the carrying power of a gas varies as the square of its velocity, it can readily be seen that a slight change in velocity will cause considerable dropping of dust particles. The fume and finer particles, however, which can be carried at very slow velocities, scarcely, if ever, approached in the blast furnace system, will be carried out into the air.

At high temperatures, the fume content of the gas is not to be underestimated. When ferromanganese is being made, manganese and potash are contained in the gas in the form of fume. Our study of the fume has been carried over a sufficient period of time and enough evidence was present during several tests to indicate that as a fume cooled it formed extremely fine dust particles, which, by the very nature of their size, took fire spontaneously when exposed to air. This phenomenon was repeated frequently in the tests made with ferromanganese blast furnace gases. The problem presented to the operator of the blast furnace is to remove the fume and the fine dust, in addition to the large particles of dust that are normally taken out by the dry dust catchers.

To accomplish this, the practice in the past in the United States has been to use washing and scrubbing systems; washing where the gases are used only for hot stoves and boilers; scrubbing where the gases are used for gas engines. Electrical precipitation has not been sufficiently developed to clean gases for gas engines. It has, however, been developed to a point where it can be used for the cleaning of gases to such an extent that they may be used in hot stoves and boilers without the inconvenience usually attending the use of dirty gases, and without the necessity of reducing the temperature to such a point that loss of heat becomes an important factor.

Advantages of Dry Method

The use of a dry system of cleaning has several advantages. It makes it possible to utilize the sensible heat of the furnace gases in the stoves and boilers; it enables the operators to secure potash from the furnace dust which has a distinct commercial value; it does not require excessive use of water and, consequently, large pumping apparatus; it prevents the pollution of streams, which is becoming a more serious problem each year.

In Europe there has been greater activity toward securing a dry cleaning process than there has been in the United States. At present there are various systems in use in both France and England for the removal of dust from blast furnace gases by dry cleaning and some of these plants are eminently successful. With keener competition for the world trade, eventually most blast furnaces will find it necessary to operate at maximum efficiency. Dirty gas is a decided handicap.

At one plant the output of the furnace was considerably decreased because of the fact that when blowing the required quantity of air the velocity of the gases and air was so great that they carried out large quantities of dust, which, in turn, repeatedly clogged the hot stoves. This resulted in frequent stoppages, that made it necessary to take the blast off while the stoves were cleaned. At this plant, there were at times masses of materials, fused into the size of boulders, 12 to 18 inches in diameter. Fire brick was so thoroughly fused with the fluxing materials contained in the dust that there was great danger of burning out the steel and cast iron which was

Modern Efficiency in Severe Test

THIS article is of timely interest in that it summarizes some of the results obtained in the practical application of the Cottrell electrical precipitation process to the removal of impurities in blast-furnace gases. The details of the process were described in the Oct. 24, 1918, issue of THE IRON TRADE REVIEW *in a paper by H. D. Egbert, presented at the annual meeting of the American Foundrymen's association. Widespread interest in the new process having been aroused, the results of tests may prove important, especially at a time when industry is struggling for greater efficiency and putting forth every effort to save and use its by-products. In this article, N. H. Gellert, president of the Gellert Engineering Co., Philadelphia, has stated clearly some of the results accomplished with the process. Mr. Gellert's contribution is particularly interesting as the tests were made for the purpose of eliminating foreign matter in gases from spiegeleisen and ferromanganese furnaces, although comparisons were made with results obtained with the same precipitator in use in connection with iron furnaces.*

protected by the brick work. Dust in the hot stoves not only destroys the brick work but soon renders it non-refractory, with resultant loss of efficiency. It then becomes necessary to heat the stoves for a greater length of time and blow the air through them a correspondingly shorter time to get results.

Measurements made indicated the following balance of dust at the furnace:

	Lbs.	Per cent
Total from furnace	19,560	100.0
Recovered by dust catcher	9,945	51.0
Recovered by hot stoves	7,111	36.4
Escaping into the air	2,504	12.6

Results With Small Precipitator

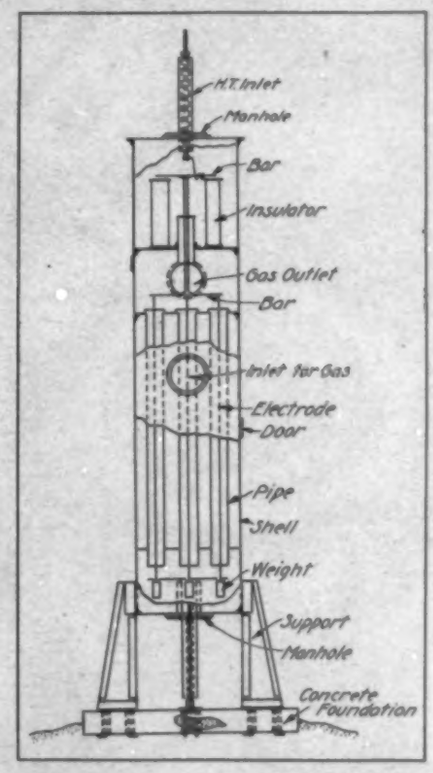
With 36.4 per cent of the dust fusing or being deposited in the brick work of the hot stoves, the results were inefficient operation of the hot stove, frequent cleaning and rapid deterioration of the brick work and interrupted operation. It was often necessary to use a sledge and hammer to loosen some of the fused matter in the bottom of the hot stoves.

A small electrical precipitator was installed at this furnace, the principle of its operation being as follows: The gas entered the precipitator through an inlet 1 foot in diameter, and surrounded six pipes, bringing them all to the same temperature as the gas. The gas then descended toward the bottom of the precipitator and went upward through the smaller pipes. It was discharged through a horizontal pipe, 1 foot in diameter, into the air where it could be observed during the operation of the precipitator. In the six pipes were hung chains, held centrally by proper brackets and suspended from the insulators on the diaphragm in the top of the precipitator.

The gas passing upward through the pipes was thus subjected to an electrical field which caused ionization of the small particles of dust and the fume, and came out of the top of the pipe free from most of the dust and fume.

The precipitator was gas tight. The gas which was turned into it was taken immediately from beyond the dust catcher. A true condition, therefore, was secured for the treatment of gases before they were burned in the hot stoves and boilers. Several interesting conditions arose that led to changes in the construction of the precipitator until best results were secured. Throughout the tests, however, the top of the precipitator was covered with a wall bushing through which the high tension leads to the precipitator were conducted. The electrical plant consisted of a 10 kilovolt ampere, 60-cycle, single phase transformer, with taps for 50,000, 62,500, 75,000, 87,500 and 100,000 volts. A mechanical rectifier driven by a 2-horsepower synchronous motor was used to rectify the alternating electrical current to direct current. The switchboard consisted of a small control panel containing one switch for the starting motor and one for putting the current on the transformer. A water rheostat regulated the amount of current supplied to the transformer. The voltages averaged between 50,000 and 54,000 and gave results that were far more satisfactory than those obtained when higher voltages were used with pipes of larger diameter.

The regular method of operating one of these tests was as follows: All the doors and manholes to the



EXPERIMENTAL ELECTRICAL PRECIPITATOR FOR BLAST FURNACE GASES

precipitator were shut tight and sealed to prevent any escape of gas or inrush of air. The bottom of the precipitator was cleaned out so that no dust was left behind from the previous run. The synchronous motor was then started and the mechanical rectifier revolved at normal speed to make sure that the rectifier was in working order. A screen thrown across the room between the rectifier and the motor cut off the high tension equipment from the low tension equipment and enabled the operator to work with perfect safety at the switchboard and motor.

When the precipitator was in good working order, the switch was thrown in on the transformer after the connection was made at the proper tap. The current was slowly brought up to the desired point by adjusting the rheostat until there was no arcing and the whole electrical equipment was working smoothly. The current was then cut off and the inlet valve to the precipitator was opened until the whole precipitator was of the same temperature as the gas passing through. This took several minutes, when the current was again thrown on. In practically every case when the right condition or temperature had been reached, precipitation took place. The voltage was moved up as quickly as possible to the desired point, which in every instance, was just below the arcing point.

In regard to the temperature, it was found that when the hot gas entered the cold interior of the precipitator, moisture in the gas was condensed, causing leakage on the insulators. If the gases were allowed to run through the precipitator for a sufficient length of time, this moisture was removed from the insulators by the heat in the gases and the insulators were then able to withstand the voltage.

Essentials Necessary for Success

Successful precipitation depends upon a thorough ionization of the gases and consequent charging of the suspended dust particles. This ionization is proportional to the current flowing from the discharge electrode into the surrounding gases. If sparking or arcing occurs the voltage will drop sufficient to lower the electrical field, thus interfering with the ionization of the gases and the consequent charging and removal of the suspended material. The result is that while the current consumption may be higher, the gas is not clean. Arcing can be guarded against by keeping the voltage low enough and by making sure that the insulators are not leaking.

After the precipitator was warmed up in the morning, it was allowed to run all day with occasional shut offs for measuring the dust. At times, the gas issuing from the precipitator was so clean that it could not be seen. But even when this condition was not obtained, the gas had but a slight haze, excepting when the precipitator failed to work due to some electrical condition.

The tests were conducted over a sufficient period to obtain necessary data for the design of a large precipitator. During some of the tests, the gases were cleaned until they contained 0.026 grains of dust per cubic foot. During one run when the operation was better than at any other time, the untreated gas contained 2.47 grains of dust per cubic foot of gas, while the gas issuing from the precip-

itator contained 0.062 grain of dust per cubic foot. The result was a 97.6 per cent elimination of dust. In all tests no elimination that was measured was under 82.3 per cent. In view of the fact that only a small amount of the dust that is ordinarily in the gas could get away from the precipitator, the results to be expected when the precipitators are put into operation are promising.

One of the favorable aspects of electrical precipitation is the fact that the precipitator removes the fume practically as well as it does the dust. This is not true of all cleaning devices. The fume may be measured by the potash content of the dust. Some of the dust precipitated contained over 20 per cent of potash, while the normal potash content in the various gases during a run when

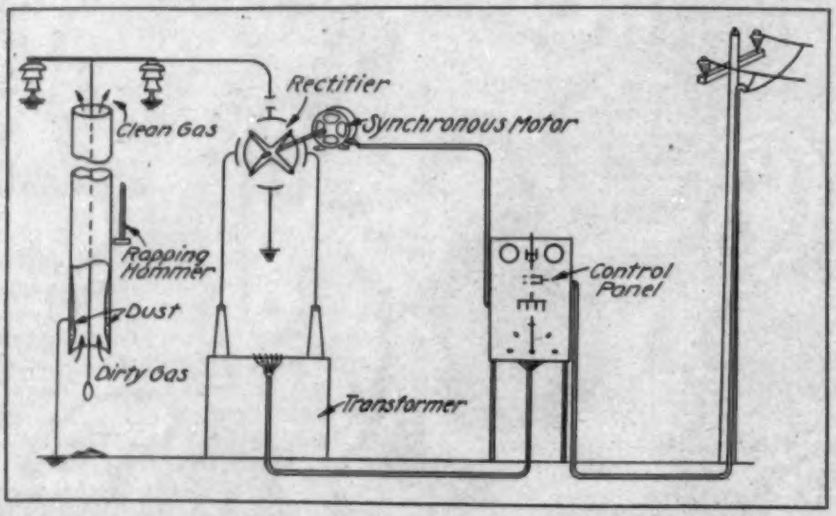


DIAGRAM OF ELECTRICAL PRECIPITATOR AND EQUIPMENT, SHOWING CONNECTIONS BETWEEN RECTIFIER, TRANSFORMER, MOTOR AND SOURCE OF CURRENT SUPPLY

spiegeleisen was made in the furnace was slightly over 10 per cent. Measurements of the potash content of the dust before and after precipitation showed that in no case during the tests was less than 80.9 per cent of the potash removed by electrical precipitation, while the best result obtained was 97.2 per cent.

In view of the fact that potash has a decided effect on the brick of the hot stoves and boilers due to its great fusing qualities, its removal is highly desirable. The mixture of potash and soda makes a good flux and as both of these are present in blast furnace gases, and as both are removed by electrical precipitation, the beneficial results to be expected are of no small value.

Engineers Elect

At the annual meeting of the Engineers' Society of Western Pennsylvania, George H. Neilson was elected president; George H. Danforth, vice president; A. Stucki, treasurer, and W. B. Spillmire and F. C. Schatz, members of the board of directors. The office of secretary is filled by the directors and they have selected K. F. Treschow, present incumbent, to continue in that position. W. E. Snyder, mechanical engineer of the American Steel & Wire Co., and retiring president of the society presented a paper on the "Practical Operation of Industrial Boilers."

The society accepted the report of a committee composed of George S. Davison, Julian Kennedy, E. B. Taylor, W. Lucien Scaife and Charles F. Scott, recommending the erection of a memorial to the late George Westinghouse on the grounds of his old homestead in Homewood, a short time ago donated to the city of Pittsburgh as a park. No formal steps were taken in the matter but a committee is to be appointed later to take charge of the raising of a fund and to decide on the character of the memorial.

French Consortium Frees Steel of Control

The French ministry of industrial reconstruction recently announced that the control of the iron and steel consortium over imports was withdrawn from Jan. 2, according to a report from the American embassy attache at Paris, which was recently published in *Commerce Reports*. Stocks on hand are now being liquidated, according to the report, and the consortium will continue to exist solely for the liquidation of stocks of iron and steel now held in various parts of France.

Applications for license to import iron and steel, hereafter should be addressed direct to the ministry of industrial reconstruction, raw materials section, bureau of importations. Applications will be ruled upon within three days, and it is understood that American firms will receive the same consideration as is given French firms.

Fritz Medal Awarded

For 1919 the John Fritz gold medal has been awarded to Gen George W. Goethals, in recognition of his services as builder of the Panama canal. The medal was awarded Jan. 17 at New York by representatives of the societies of civil, mining, mechanical and electrical engineers. The John Fritz medal previously has been awarded to John Fritz, Lord Kelvin, George Westinghouse, Alexander Graham Bell, Thomas A. Edison, Charles T. Porter, Alfred Nobel, Sir William Genry White, Robert W. Hunt, John Edson Sweet, James Douglas, Elihu Thomson, Henry M. Howe, and J. Waldo Smith.

Electric Heating Furnaces

The Electric Furnace Co., Alliance, O., has closed a contract with the Standard Roller Bearing Co., Philadelphia, for a 190-kilowatt continuous, automatic, heat-treating equipment. The set consists of one 150-kilowatt electric furnace for hardening and one 40-kilowatt electric heated oil drawing bath. There is supplied in addition an oil-quench bath located between the furnace and the electric-heated, oil drawing bath. Material, which consists of alloy steel balls and ball races, is automatically handled through the furnaces, quench and drawing baths, in metal baskets.

War Work Studied

The historical branch of the war department is making a thorough study under direction of the general staff of the way in which the economic resources of the United States were mobilized for the war. This is in accordance with the suggestion contained in the last annual report of Secretary Baker to the effect that only after long historical inquiry can the war activities of the nation be thoroughly understood and analyzed for guidance in the future. A pamphlet issued by the economic mobilization section of the war department refers to General Pershing's comment on the failure of a part of the material program to keep pace with training, and draws the conclusion that "in the next great war the nation which best understands its economic resources and possesses them in sufficient abundance will surely be victorious."

Japan to Have Massive Roll Lathe

Huge Tool is Motor Driven and is Provided With Several Spindle Speeds—The Bed is Made in Sections to Facilitate Transportation—Total Weight of the Lathe is Approximately 275,000 Pounds

MODERN rolling mills designed to roll heavy plates are necessarily equipped with massive rolls. To turn these rolls when they become worn requires a large lathe of special design. What is said to be the largest lathe ever built is shown in the accompanying illustration. It is a product of the Standard Engineering Co., Ellwood City, Pa., and will be exported to Japan. On account of the increasing demands for larger production and more accurate work, it was the intention of the builder to design a machine so massive and heavy that large rolls could be turned in a minimum amount of time and with the least possible chance of vibration and chatter. The lathe swings 62 inches over the necking rests and in front of the piano rest and its total weight is approximately 275,000 pounds.

Bed 42 Feet Long

The bed is 42 feet long, not including the extension for supporting the motor, and weighs about 1400 pounds per lineal foot. On account of the difficulty in transportation, it is made in three sections each 14 feet long. In addition to being bolted together at the joints, a heavy plate is bolted up against the bottom and keys driven in between lugs on the bottom of the bed and top of the plate, thus providing additional means of drawing sections of the bed together. These plates also serve to keep the bed sections in line with each other. In addition shrink links are inserted at the joints.

All headstock gears have cut teeth of large size and broad face and, with the exception of the pinion on the motor, are made of steel. The motor gears are 2½ diametrical pitch with 6-inch face. The next pair in the speed reduction is 2 diametrical pitch with 8-inch face. The next, which are the change gears, are 1½ diametrical pitch with 10-inch face and the last pair inside the headstock 1 diametrical pitch with 12-inch face. The internal gear, cut in the face plate, is 4-inch circular pitch by 14-inch face. All these gears, except the motor pinion and its gear which run in a separate case, and the face plate gear and its pinion, are entirely enclosed within the headstock. They are constantly lubricated by streams of oil from a geared pump which also furnishes oil for the bearings.

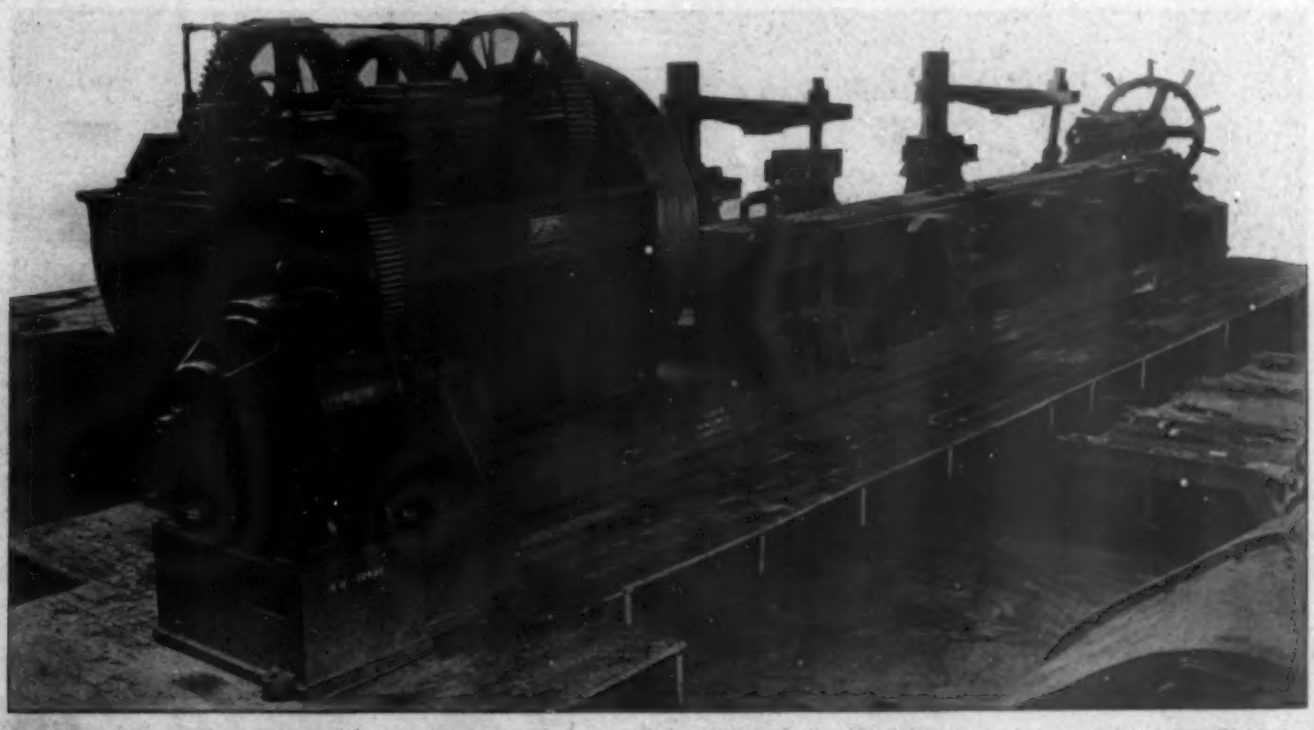
In addition to the various speeds obtainable by the adjustable speed motor, the machine is provided with sliding gears giving two speeds for each motor speed. These gears are moved by the screw and handwheel shown at the end of the headstock. The slowest speed of the face plate is two-tenths of a revolution per minute. The headstock is provided with a cast iron cover. The design is such that when the cover is lifted off, all gears and moving parts are easily accessible. The headstock spindle is 14 inches in diameter.

All housings are steel. In addition to the two of regulation type there is a third housing for supporting the roll at the center and also for giving additional support to the piano rest.

The necking rests are so heavy that they have been furnished with feed screws for moving them on their saddles.

Tailstock Weighs 17,000 Pounds

The tailstock is a steel casting and its hold-down bolts are so arranged that it can be quickly lifted from any part of the bed. As it weighs about 17,000 pounds, it was decided to move it by means of a crane and, therefore, no rollers have been provided underneath. The handwheel has notches in it, and a bar 10 feet long with one



LARGE ROLL TURNING LATHE RECENTLY BUILT FOR EXPORT TO THE FAR EAST—THE HEADSTOCK COVER IS REMOVED TO SHOW THE GEARING

end pivoted to the handwheel hub is provided for applying pressure. The tailstock spindle is 11 inches in diameter. This lathe is intended for turning plate mill rolls 49 inches diameter by 180 inches long between necks having a finished weight of approximately 135,000 pounds, but other sizes can readily be turned.

Reversing Valve of Water-Sealed Type

IN the operation of any gas-fired furnace, it is highly desirable that the valve controlling the direction of the flow of gas shall operate rapidly and easily. These factors were kept in mind in designing the new gas reversing valve which has just been placed upon the market by the Wellman-Seaver-Morgan Co., Cleveland. That the conditions have been met is evidenced by the fact that a 36-inch hand-operated valve can be reversed from three to seven and a half seconds with a pressure of not over 25 pounds. This is accomplished by a balanced hood and counterweights.

The operating mechanism is outside of the casing where it is easily accessible and always cool. The valve is similar in principle to the well-known Forter valve and is interchangeable as to ports and clearances. The general design and construction of the valve are shown in the accompanying illustration. It consists of an outer casing, a base with three ports, a hood to connect two ports, and the operating mechanism.

The center port is connected to the chimney. Waste gases from the furnace to the chimney port flow from the outside port which the hood is covering at the time. This leaves a clear passage for the fuel gas or the air, both of which enter the casing through the mushroom valve at the top and pass through the third port to the furnace regenerator. Reversal of the flow of gas or air is accomplished by moving the hood to a position over the center port and the one previously uncovered.

Hood Permits Free Gas Flow

The base of the valve is a cast iron rectangular pan with three-walled circular openings or ports. The hood, which covers the center and one end port, is of semielliptical form. It is made of steel plates with angles at the bottom to support a fire brick lining. The base pan holds a quantity of water so that when the hood is over the ports, a waterseal is formed to prevent the escape of gas. The base pan has a tapped hole at each end for a water pipe. There is a perforated strainer at the intake end and a dam plate at the other end to hold the water at such a level as to allow the hood to extend 3 inches into the waterseal.

The outer casing is made of steel plate and lined with fire brick. It has cast-iron door frames and a door at each end. The hood may be removed or inserted through the latter. Each door has a small peek hole with a swinging cover which enables inspection at any time. On the top of the casing is a cast-iron neck. This connects either with the fuel-gas flue or the air intake, depending upon the purpose for which the valve is used. The hood is moved by a series of levers and coupling shafts which extend through the water under the casing and into sockets on the hood. The shafts move on chilled-iron bearings.

With all hand-operated valves, a special stand is furnished as well as six sheaves with hangers, clamps and wire rope. At each side of the valve is a counterweight. This is attached to an arm and sector over which passes a chain. The latter connects with the supports of the hood. The sector is built so that the counterweights balance the weight of the hood at any position.

The semielliptical form of the hood allows free flow of the gas, inasmuch as there are no abrupt turns or con-

(*Concluded on Page* 467)

NEW TYPE REVERSING VALVE SHOWING THE OUTER CASING, THE BASE WITH THREE PORTS, HOOD FOR CONNECTING TWO PARTS AND OPERATING MECHANISM

Canada Organizing for Vast Trade

Manufacturers' Association Groups Producers and Issues List of Commodities for Which There is an Immediate Market in Belgium—Government Buying Rail Equipment—Big Plants Being Extended

TORONTO, Ont., Feb. 10.—To impress on manufacturers the necessity for organizing into trade groups to be ready to compete with other countries for a share of the work of rebuilding Europe, the intelligence department of the Canadian Manufacturers' association is issuing a circular calling for concerted action. Manufacturers, it is said, must be prepared to turn out standardized products in quantity.

Illustrating the opportunities, the circular enumerates some of the immediate requirements of a part of Belgium. The list includes: Copper, sheets, bars and ingots, 39,000 tons; brass, sheets and tubes, 3500 tons; machine tools, 60,000 tons; hawsers, steel cables, belting and electric power plants for colliery requirements; pig iron, 1,012,050 tons; iron and steel, worked and semiworked, 825,000 tons; transport material for railroads, locomotives, trucks, etc.; automobile transportation material, trucks, trailers, cars; depot material, turntables, forges, pits, drilling machines, jacks, etc.; material for reconstruction of destroyed buildings and for new construction; crushers, mixers, hoists, cranes, bridges, locks, pontoons, chains and accessories; dredging material, dredges, tugs and lighters; canal equipment, lighters, pumps, compressors, tugs; machines for road and construction work, scrapers, rollers, graders, etc., boilers, engine pumps, steam shovels; small tools, shovels, picks, mattocks, etc.; railway construction material; rails and accessories, tools, machine tools, motors, signalling apparatus; agricultural machinery; plows, single, 40,000 tons; plows, two or more shares, 20,000 tons; skimmers, scarifiers and cultivators, 20,000 tons; harrows, 75,000 tons; ordinary rollers, 20,000 tons; disc rollers, 10,000 tons; horse hoes, 10,000 tons; potato plows, 10,000 tons; seed drills, 2000 tons; reapers and binders, 2000 tons; mowers, 2000 tons; horse forks, 2000 tons; horse rakes, 2000 tons; winnowing machines, 50,000 tons; root cutters, 10,000 tons; chaffers, 15,000 tons; churns, 50,000 tons; carts and vans, 100,000 tons.

In the course of an address to the Canadian Manufacturers' association, on prospects for trade with Great Britain, France and Belgium for Canadian iron and steel products, Col. David Carnegie, of the Imperial Munitions board said: "We have fine deposits of magnesite in Canada, developed during the war, which is of excellent value for our furnaces, making it unnecessary to import as hitherto. Our carbon electrodes are second to none and cheaper than are produced in England and we have nickel in abundance. Everything, in fact, calls for Canada to rise to the first rank as producer of quality steels."

President Mark Workman, of the Dominion Steel Corp., stated before sailing for Europe recently that the main purpose of his trip is to secure large steel contracts.

Plan New Plate Mills

Plans of the Dominion Foundries & Steel Co., of Hamilton, Ont., for readjustment to peace conditions include the installation of a plate mill with a capacity of from 10,000 to 12,000 tons per month. The size of plate to be rolled will be 42-inch universal and 84-inch sheared, the large size being suitable for shipbuilding, bridges and structural work. A pattern shop to cost $75,000 is being built, and an office building to cost a similar amount will be built. The Canadian Cartridge Co., of Hamilton, Ont., has begun the manufacture of steel barrels, for which there is an increasing market. The company also is making active preparations to commence the manufacture of metal stampings and drop forgings. There is considered to be an extensive field for the marketing of metal stampings in connection with the automobile, agricultural implement and car building industries.

The Canadian government has ordered 2830 cars for the Canadian national railways, the detailed list being as follows: From the Canadian Car & Foundry Co., Montreal, 500 stock cars, 250 ballast cars, 150 refrigerator cars, 100 colonist cars, 30 baggage cars, total, 1030; from the Eastern Car Co., New Glasgow, N. S., 500 flat cars, 550 all-steel general service cars, total, 1050; from the National Car Co., Hamilton, Ont., 750 steel underframe box cars.

President D. H. McDougall, of the Nova Scotia Steel & Coal Co., New Glasgow, N. S., announces that new business is offering only to a limited extent and at prices that are not attractive. Consequently, the company has decided to make needed repairs and extensions during the slack time. These will include new by-product coke ovens of modern type at Sydney, and development of the ore mines at Wabana, Newfoundland, so as to enable the company to produce iron ore much in excess of its former output and at reduced cost.

With development of the Wabana mines, Mr. McDougall said, the company will be in a position to enter the ore markets of the world on a scale commensurate with its vast resources of iron ore. The company is in a remarkably strong financial position, having net current assets of over $10,000,000.

Reports of operation of the Algoma Steel Co., Sault Ste. Marie, covering the last six months of 1918 show a great increase in production. The steel plant turned out 204,557 tons, as compared with 139,198 in the same period of the previous year, an increase of 65,359 tons.

Secretary Alexander Taylor, of the Lake Superior Corp., has issued a statement in which he says: "Rail and other business on hand should keep our mills operating well into the balance of the current fiscal year. The net earnings of the corporation for the six months ending Dec. 31, show a substantial increase over the corresponding six months of the last fiscal year. The first battery of 25 coke ovens was completed and produced coke on Oct. 25, and the second battery should be producing early in February. That will complete all heavy construction work under way."

A bounty of 50 cents a ton on all iron mined and smelted in Canada is sought by the residents of the district of Port Arthur, in a petition forwarded to the dominion government. The establishment of a blast furnace and steel plant, with the support of the government, at or near Port Arthur, also is requested. The petitioners would have $15,000,000 provided for the establishment of a government blast furnace and steel plant, and urge that the interest for 30 years on 80 per cent of the actual capital invested be guaranteed or, as an alternative, that the same guarantees be allowed as were extended to Canadian drydocks and shipbuilding plants, to the extent of $13,000,000.

British Iron Supply Below Demand

Consumers Offering Many Orders Before Government Ceases to Pay Subsidy—Prices of Finished Material Advance—Export Business is Not Yet Taken Seriously—Puddlers' Strike Affects Plants

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Jan. 30.

USERS of pig iron have at last realized that when the government ceases to pay the subsidy, the consumer will have to shoulder the difference, and, accordingly, many orders are offered. The golden moment for the placing of advantageous contracts has passed, however, as by this time the makers also have fully grasped the situation and have tied up all customers to contracts by which the latter will be made to pay whatever extra is necessary to save the producer from loss.

The difference in price will be nearly 30s ($7.20). One suggestion which appears to be commending itself is that when the subsidy is withdrawn at the end of April the price shall be advanced 27s 6d ($6.60). This is meant to cover the 18s ($4.32) equivalent of the subsidy and 9s 6d ($3.38) representing other expenses which the trade cannot at present charge to the ministry of munitions. Makers have no doubt about their ability to insist upon this price when the government relinquishes control.

Supplies are considerably below demand. The scarcity would be felt more severely but for the combination of circumstances, including labor unrest over the 47-hour system, shortage of coal, etc., which reduces the consumption of pig iron in various lines. The disputes in the shipbuilding yards constitute the most typical and important example of the kind. Pig iron production has fallen off, owing to so many furnaces having been blown out for repairs and relining. It is increasingly evident that some of the furnaces were worn out and soon would have broken down. Most consumers have small stocks. More iron is being sent to the Midlands and Scotland from Cleveland, owing to better transport facilities. Prices everywhere are at the official maximum. The hematite available is still being carefully distributed with a view to the meeting of most urgent wants first. Foundry iron continues in the most urgent demand.

There is widespread satisfaction with the excellent progress made in the opening up of the new ore beds near Banbury. This new source of supply is within easy reach of the most important iron and steel localities, and the beds lie so near the surface, in some cases 18 inches, that they can be cheaply and easily worked.

Prices of Finished Iron Advance

The quarterly meeting in Birmingham Jan. 18 afforded an interesting indication of the state of trade. Obviously transition influences still dominate the market. Export business is not yet taken seriously, and very few exporting merchants attended. This is due partly to scarcity of shipping, very few ships being available for ordinary trade of this kind. The attendance of the Welsh tin plate producers also was small, their business not yet having got into its stride. It will soon develop, however, as there are now plenty of sheet bars available, and more skilled workmen are coming back from the war.

It was a cheerful meeting, the pessimists who have been so much in evidence lately having gone into the background, with good reason. The rise in bars reported a week ago is too strong an evidence of the underlying strength of the situation to overlook and it now appears that other advances, one in bars, and the other in gas strip, are the subject of negotiations with London, and are confidently expected to be allowed shortly. An important advance was declared recently by the makers of mill rolls who put up grain and chilled rolls £2 ($9.60) each, following a rise of £1 ($4.80) three months ago. The end of the fighting has led to a general inventory, and mill owners find they want a lot of new rolls to complete their equipment, with the result that the foundries are flooded with orders. They have great difficulty in getting enough best foundry iron to meet all requirements.

Those merchants who placed good orders in December are congratulating themselves on their foresight and they mean to continue buying. They have been well rewarded for their optimism by the recent advances in the price of iron. Other less sagacious traders are now coming in with their orders, but find themselves a long way in the rear, with little chance of getting attention.

The year began with a strike, involving several large works, in the Black country. Puddled iron is practically an unpurchasable commodity, yet the puddlers threw down their tools more than a week ago because they claimed a war bonus of 3d (6c) a day, the same as given to helpers who are paid much less. The puddlers have been receiving about £1 10s ($7.20) per day, 5s ($1.20) above the old record rates. The strike involved some union rivalry, as the Puddlers' union is jealous of the Ironworkers' confederation. The employers resisted the demand, and the puddlers' section of the wage board condemned the strike with the result that the men returned to work without having obtained their demands.

The strike of 150,000 miners in the Yorkshire district also was of short duration, but the disturbing circumstance to manufacturers is that the strike terminated in the usual way of large strikes, by the concession of the terms demanded by the men. The belief prevails that sooner or later a stand will have to be made against these endless demands which appear to be stimulated by every concession. Twice within a few months great strikes of this kind have been terminated by complete capitulation of the employers.

As a result of the expected rise in the price of steel billets next month makers of steel strip have added £1 10s ($7.20) to their prices for February delivery, making the rate £19 5s ($91.68). Future orders will have to be "at the prices current at time of delivery." An advance of 15s ($3.60) in the price of Lancashire nut and bolt iron becomes effective Feb. 1. This will make the selling figure £16 15s ($80.40), delivered in the Black country.

Like the galvanized sheet trade, the holloware trade which has been practically commandeered for war requirements is slowly being reconstructed. Sheets are difficult to get, and the workmen are coming back slowly. Shipbuilding still takes a big share of the best iron made, as well as a good proportion of the steel production.

A cablegram has been received from the American consul at Brussels, asking that catalogs, trade journals, etc., be sent to the American consulates in Belgium, for the Central Committee of Belgian Industries.

West Blocked on Orient Shipments

High Transatlantic Rail Rates Leave Advantage With Atlantic Ports by Canal Route Despite Reduction of Vessel Carriage Costs—American Billets May Now be Laid Down in China Under British Price

(Special Correspondence)

SAN FRANCISCO, Feb. 5.—Despite the reduction of transpacific freight rates from $30 to $12 per deadweight ton and from $35 to $14 per measured ton, announced by the shipping board effective March 1, steel and iron products, such as angles, bars, nails, rails, rods, staples and wire, originating in the eastern steel manufacturing centers, can be shipped to the Orient through the north Atlantic ports by way of the Panama canal at a lower rate than they can be exported through San Francisco and other Pacific coast ports. Practically no steel or iron is being booked for shipment through Pacific ports because, due to the high transcontinental rail rates, it is impossible to route the shipments overland and meet the prices of British mills.

Taking steel billets as an example, the price at the British mills is $56.50 a ton. The rail rate to the seaboard is $4 and the ocean rate to China is $12, making the total cost per ton, laid down in China $72.50. Steel billets may be purchased from American mills for $43.50 a ton. The transcontinental rail rate is $17, plus the present $30 rate across the Pacific, which makes the cost laid down in the Orient $90.50. At the new transpacific rate of $12 per ton, the total c.i.f. China is $72.50, or just equal to the British price. On the other hand, this same shipment of American steel might be shipped through north Atlantic ports and laid down in the Orient for $69.50, since the rail rate to the seaboard is $6 and the water rate through the canal to the Orient is $20 a ton.

Limited Effect in Pacific

The reduction in the transpacific rates has much less significance on the west coast than such an announcement might have on the Atlantic because the shipping board operates so few vessels in the transpacific trade that it is unable to control rates by a simple announcement. Although the shipping board rate is now $30, many shippers are paying $40 a ton for the actual transportation of their freight because of the scarcity of government-owned or operated vessels. The shipping board has let it be understood that more steamers will be assigned to this service, but they are not yet in sight.

Divert Steamships

In the meanwhile, Robert Dollar, perhaps the keenest operator of steamers on the Pacific coast, has announced that his entire fleet of vessels, which formerly operated between the Orient and Vancouver, B. C., under the flag of the Robert Dollar Steamship Co., has been diverted to the New York-Oriental service. Westerners in touch with the situation consider this action a simple symptom of a remediable difficulty which was brought about when the railroad administration engaged in wholesale cancellations of import and export transcontinental rates on June 24, 1918. This was a war measure and met with no opposition from the persons affected, but with the signing of the armistice and the release of shipping, the situation has changed and exporters and importers operating on the Pacific coast now find their business virtually wiped out. The movement of goods through Pacific ports to and from the Orient is impossible under the prevailing high rail rates, men engaged in this business say and they cite, among other examples, an increase from 40 cents to 85 cents on export steel. Strenuous efforts are being made by various western commercial interests and organizations to secure the immediate re-establishment of the import and export tariffs which were effective prior to June 24, 1918. Few are to be found, however, who believe that this undertaking will be accomplished in the near future.

Steamship companies operating out of San Francisco have petitioned the railroad administration to equalize delivery there with Puget Sound and British Columbia ports by having the railroads absorb $1 per ton of the charges for loading and unloading, storage, wharfage and handling. The administration attempted to effect an equalization by placing the entire burden on the steamship companies both at San Francisco and at the northern terminals. The steamship companies oppose this solution, although their contentions obviously are prejudicial to the attempts being made to secure a reduction on the transcontinental import and export rates.

Industry in the west, and particularly in the San Francisco bay district is going full speed ahead in spite of strikes and the cessation of war, according to information made available by the federal reserve board of this district. The northwest labor problem presents a serious aspect and in Los Angeles too there is a trace of uneasiness over the employment problem, but in San Francisco there appears to be plenty of work to be done and soldiers are finding little difficulty in re-entering the commercial life of the community. Shipbuilding, the principal industry of the district, is continuing its activity, so far as the steel ships are concerned and the elimination of overtime is but a slowing down of pre-armistice speed.

Cancel Contracts for 34 Hulls

The first step in the general revision of the shipbuilding program of the Emergency Fleet corporation resulted in the cancellation of contracts of the construction of 34 hulls in five California shipyards. The number of ship orders cancelled and the yards affected by the order were as follows: Long Beach Shipbuilding Company, 6 hulls; Western Pipe & Steel Co., (Schaw-Batcher yards in South San Francisco), 4 hulls; Southwestern Shipbuilding Co. in East San Pedro, Cal., 8 hulls; Los Angeles Shipbuilding & Drydock Co., San Pedro, Cal., 10 hulls, and Hanlon Drydock & Shipbuilding Co., Oakland, Cal., 6 hulls. All of the vessels included in the cancellation order were of 8800 tons or under which were scheduled for delivery during 1920.

The yards affected by the order still retain contracts for the building of the following number of steel vessels not yet delivered: Long Beach Shipbuilding Co., 7 hulls; Western Pipe & Steel Co., 15 hulls; South western Shipbuilding Co., 14 hulls; Los Angeles Shipbuilding & Drydock Co., 21 hulls and Hanlon Drydock & Shipbuilding Co., 6 hulls.

Propose Joint Plan to Lower Prices

Secretary Redfield Outlines at Washington Conference Original Method to Determine Fair Selling Prices in Basic Industries Without Lowering Wages—Would Have President Name Board to Consult With Leaders in Industry

WASHINGTON, Feb. 11.—Unprecedented in peace times, and sweeping in its possibilities is the proposed plan of Secretary of Commerce William C. Redfield to establish government regulation over the iron and steel and all other basic industries involving the reduction in prices without lowering wages. The announced object of this remarkable proposal is to stabilize industry and labor and to solve the unemployment problem. In brief it calls for the selection by the President of a committee which would call into conference the representatives of the basic industries of the country to examine fundamental conditions with the view to the formulation of a scale of prices at which the government and "other buyers" would be justified in buying "freely and at which the manufacturers would be willing to sell with a view to maintaining or restoring business activities to a full volume." The committee would be made up largely of former members of the war industries board and would act in an advisory capacity to the secretary of commerce.

The plan was outlined in definite form at a meeting held in Washington on Feb. 5, which was called by Secretary Redfield to consider the industrial situation with particular reference to unemployment and to the prospect of resumption of active buying. This meeting, which followed a series of conferences between members of the cabinet and others, was attended by a number of former heads of the more important divisions of the war industries board, representatives of various government departments, trade paper publishers, and others interested in the subject. It is claimed by those sponsoring the plan that it can be invoked without violating the law or calling for any legislation.

Plan Given Much Thought

Previous intimations had been given out that such a plan was under way. Perhaps the first was that carried in an address by John Franklin Fort, a member of the federal trade commission, before the New York Credit Men's association in New York City on the evening of Jan. 30. In the course of his remarks on co-operation in trade, he suggested that it might be a wise thing, in order to stabilize industry and employment conditions to have representatives of industries get together and determine prices, and then have them submitted to some governmental body, which could then investigate and pass upon the regulated prices. By such a plan, he pointed out that the industries would be safe from legal proceedings, although he said it might be necessary to amend the Sherman act. Closely following his discourse, Secretary of Labor William B. Wilson, at a joint hearing of the house and senate committees on labor and education, said the secretary of commerce was planning to hold a series of conferences with men in the most important industries of the country with a view to fixing reduced prices, without having wages cut.

At the meeting of Feb. 5, William B. Dickson, vice president of the Midvale Steel & Ordnance Co., was present and is said to have given views regarding fixing prices in the steel industry.

Extensive Machinery Required

Exactly what machinery would be set up, its scope and other details have not been announced, if they have been worked out. On the face of the situation it would seem that the machinery will be of an extensive character. The committee to be named by the President would investigate production costs in all fields and recommend prices. Producers, consumers and labor representatives would be asked to co-operate in determining the prices. It is reported that if the plan is put into effect the railroad administration and other government departments would come into the market for heavy requirements. It is hoped that consumers would do likewise.

In announcing the plan, Secretary Redfield said it was recognized by the meeting that a considerable amount of unemployment existed and that with the return of the troops this unemployment would tend to increase.

"It was also recognized that in a large measure the unemployment was seasonal and due to the impossibility of carrying out open-air construction in the northern states at this time of the year," said Secretary Redfield. "It was, however, agreed that a second important cause was the reluctance of buyers to purchase more than their emergency requirements at the present level of prices, and it was felt that a determination of a post-war level of prices for basic commodities was urgently needed. It was the general opinion, illustrated by many specific cases, that a large latent buying power existed in the country which needed only a satisfactory level of prices to become effective. It was pointed out that the establishment of a satisfactory level of prices at this time offered particular difficulties, because war prices, as fixed, are recognized as abnormal; on the other hand, there is no prospect in the immediate future of the restoration of prewar prices. It was felt that wages would remain on a higher level than before the European war and that no readjustment in true wages of labor as measured by purchasing power should be attempted, though it was felt that as the cost of living is reduced, labor would readily agree to the corresponding adjustments in money wages.

"If events are left to take the natural course, the establishment of post-war prices would probably be a difficult and protracted matter since prices of one commodity affect other commodities and producers would wait for another to take the first step. Such a course of procedure would involve much unemployment and a loss to both labor and capital.

"It was the sense of the meeting that the fine spirit of voluntary co-operation in industry which had proved such a valuable factor in the conduct of the war should be availed of to ease and expedite the processes of readjustment and that the manufacturers of the country would be willing to take the first step.

Redfield to See President

"After a full discussion of the situation which occupied the greater part of the day, a resolution was adopted, asking the secretary of commerce to seek the approval of the President to the appointment of a committee to deal with the situation. It was contemplated that this committee should call into conference the representatives of the basic industries of the country to examine conditions in industry with a view to the formulation of a scale of prices at which the government departments and other buyers would be justified in buying freely and at which the manufacturers would be willing to sell with a view to maintaining or restoring business activities to a full volume. It was felt that time was the very essence of the problem and that therefore the appointment and action of the committee should proceed with all possible speed.

It was believed that public announcement of the conclusions of such a committee would have a great value in establishing confidence in a level of prices and would be accepted by bankers and others as a basis for credit."

Conditions confronting the country now were summarized by Secretary Redfield, with plans of solving them, as follows:

Unemployment of labor now is large and rapidly increasing.

A stagnant condition of industry due to several reasons: (a) Industries are not resuming production in full volume for lack of buyers. (b) Consumers are not buying except for immediate needs or emergency requirements, because of high and unstable prices. (c) Prices are high and unstable, due to the effects of the war, which interfered with the ordinary operation of the law of supply and demand. Prices were inflated beyond the possibility of maintenance upon the same scale during peacetime. They advanced or were fixed to encourage maximum production by producers operating at the highest cost. They advanced disproportionately, some showing increases over the prewar prices of 250 per cent, while others showed but 50 per cent. These advanced prices largely obtain now, and unless concerted action on the part of industry and government is taken, a long time will be required by the law of supply and demand to reduce them to the proper level.

This stagnant condition of industry is equally detrimental to labor, capital and government, and it is believed that industry will welcome an opportunity to put the prices of its commodities upon a sound and staple basis.

This staple basis, it is clear, must be upon a higher scale of price than those of the prewar period.

If the President approves the plan, the cause of action as stated by Secretary Redfield will be:

If the approval of the President is had, I contemplate appointing a board largely from the division heads of the war industries board, with a view to co-ordinating the interest and efforts of government, labor and industry, in an effort to remedy present industrial conditions.

It is designed that this board shall from time to time call into conference the industries of the country, and the first of these conferences will be with committees or representatives of industries producing basic materials such as iron, steel, textiles, cement, lumber, copper, brick and other construction materials.

These conferences will be designed to ascertain the present fair selling prices of materials.

The board will, pursuant to these conferences, and upon considering the recommendation of the representatives of industry, form and announce its conclusions.

The work of the board will be continued so long as it may be deemed in the public interest for the good of all.

It is felt that the public announcement of the conclusions of the board after the conferences contemplated will be of great value in establishing a proper level of prices, and the stability thereof, and will induce a general resumption of industrial activity, such as the deferred building program, and that operations undertaken thereafter in pursuance of the policies announced will afford a safe basis for business transactions and serve as a basis for consideration by bankers and others in order to enable them to determine proper bases for credit of industrial enterprises.

Britain Loosens Up On Tool Embargo

WASHINGTON, Feb. 11.—With official information supplied last week to the senate that Great Britain is willing to change its recently announced plans for an embargo, effective March 15, so as to give adequate protection to her own industries without damaging those of America, protests are being made against restrictive policies of this government forbidding the exportation of certain products. There also is a growing objection to the policy of President Wilson which prevents the United States shipping board from granting permits to American shipyards to take contracts for the construction of steel ships for foreign account. Both shipbuilders and steel manufacturers have made protests against this latter policy.

It is believed that the British embargo will be the source of less difficulty than otherwise was promised in view of the attitude of the British government. But while this question appears to be becoming less acute the restrictions on American business placed by this government are not being removed fast enough to suit those protesting against them.

Information relating to the attitude of Great Britain on the embargo matter was to the effect that that government does not desire to discriminate against American products in necessary embargoes during the period that British industries are recovering from the effects of the war.

The British government, while insisting that some sort of embargo is necessary for a time, is ready to leave the entire subject for settlement by a special commission meeting in Paris and of which Vance McCormick, chairman of the United States war trade board, would be a member.

There has been considerable talk in congress about declaring embargoes against the importation of such commodities as manganese and chrome ore, and potash. With competition for foreign products, it is asserted, these industries stand to lose heavily from their having made big investments to meet war requirements of the government. Opposing this demand for these embargoes there is strong protest by numerous consumers of the products mentioned against the declaration of embargoes.

Among policies of this government which have been criticised severely is that of the war trade board for restraining the exportation of many American products. Exporters have written to members of congress objecting to this policy and in taking up their claims. Representative J. Hampton Moore, of Pennsylvania, said the British government is not assigning shipping space to American commodities, a charge, which some say, cannot be satisfactorily supported. Mr. Moore said, however, that as a result markets eager for American goods, such as those of South America, are being closed to Americans by "the British shipping net." In this connection others, who, while not in agreement with policies of this government, say that the present situation only emphasizes the great need for an American merchant marine and that no nation can be justly censured for looking after its own interests first, but rather should do so.

After saying that both the French and English are closing their markets against American automobiles, Mr. Moore called attention to a letter from the Metal Export Co. of America, New York City, saying that it is shut off from filling five orders, valued at $150,000, from Scandinavia, because it is unable to obtain export licenses, by reason of the fact that its customers have been unable or unwilling to obtain their import numbers on account of purely local and political reasons in their own country and that unless it gets a license from the war trade board the business will go to a foreign power which is waiting to take the orders once the credits expire.

Price-Fixing Committee to End Career March 1

Washington, Feb. 11.—Effective March 1, the price fixing committee of the war industries board will no longer exist. This has been an-

nounced through the publication in the *Official Bulletin* of the committee on public information of the joint letter of the committee to the President at Paris and his reply. The committee held over after Jan. 1, the day on which the war industries board was dissolved, because the prices fixed on some commodities will not expire until March 1.

The correspondence passing between President Wilson and members of the price fixing committee follows:

American Commission
to Negotiate Peace,
28 Rue de Monceau, Pa
Jan. 13, 19.

My Dear Mr. Brookings: I warmly appreciate your letter of Dec. 23, which was slow in reaching me, and I hereby accept as you and they request, the resignations of the members of the price fixing committee, as taking effect March 1.

May I not say that I do this with a very full and deep appreciation of the laborious and valuable—indeed indispensable—services which the committee has rendered? I have followed its conclusions not only with the greatest interest, but with an appreciation of the great sobriety and judgment which characterized them, and I shall long remember with the greatest appreciation my associations with them.

Cordially and sincerely yours,
Woodrow Wilson.

Hon. Robert S. Brookings,
War Industries Board,
Washington, D. C.

In their letter to the President tendering their resignations, the members of the price fixing committee said: No new price regulations seem to be called for, and those which have been made will be allowed by the committee to expire at the dates severally set.

The latest date for the expiration of a price-fixing agreement is March 1, 1919. Until that time, questions may arise concerning the interpretation and administration of the agreements still pending. The committee stands ready to continue in service for the disposition of any such questions. Although some members of the committee may withdraw from government service before March 1, others will remain, and will be able to serve if needed. The committee accordingly requests that it be finally released from its duties on that date.

The membership of the price fixing committee consisted of Robert S. Brookings, B. M. Baruch, H. A. Garfield, John M. Hancock, F. W. Taussig, Hugh Frayne, Robt. H. Montgomery, W. B. Colver, Henry C. Stuart.

Study Trade and Diplomatic Questions

WASHINGTON, Feb. 11.—Carrying an appropriation of $200,000 to pay consular agents for work in connection with the expansion of foreign trade, the legislative, executive and judicial bill now is pending in the senate, having been acted upon previously by the house. The agents referred to are to be "temporary employes in the department of state", whose fields will be broad, including Latin America, Mexico, Cuba, Haiti, the West Indies, and other countries in that section; western Europe, the Near East, the Far East and Russia.

While the consular work comes under the state department because of the diplomatic mission involved, the agents will co-operate with the department of commerce in gathering information which will be of aid to the business interests of the United States. Senator Underwood, in discussing the amendment, said foreign competitors in industrial lines are spending a great deal more than this government in prosecuting the kind of work mentioned.

Last year the attention of the state department was called to the strategic position of raw material as it affected war conditions, as to where it could be had, as to the ordinary channels of trade, and as to the opportunities and necessities for diverting it from enemy countries. The investigation is being completed and the results will be applied to peace conditions. The state department has gathered considerable information with respect to what other nations are doing to expand foreign trade and efforts are being made to put this government in a position to meet such competition.

The question of collective buying for foreign nations also is being given attention. Most of the principal European nations have arranged for collective action by their buyers or importers, each individual line of trade to supersede the competitive purchasing formerly practiced. This is held to put the American exporter at a fatal disadvantage. In France a special system of consorting has been built up during the war, it was stated, and in each line of trade a French comptoir purchases all goods imported into France, seriously affecting certain lines of American trade. The foreign trade advisers' office has been forced to study the facts relating to lines of trade involved with relation to efforts upon the national interests which would result from the making of forcible diplomatic representations to France along these lines. Actual trade figures are procured for the department of commerce, but they must be painstakingly analyzed by the same officers who have the current diplomatic situation in hand—the officers of the department of state.

Collective selling on the part of foreign competitors, it has been pointed out, is requiring organization in this country to meet conditions that must be met in the competitive markets of the world, and that can be done only through the diplomatic channel. Foreign government monopolies are also spoken of as requiring investigation.

The international cable situation is another problem that has to be studied by the department of state. A reasonable sum in the pending bill will be used to study the problems of American control of the cable system. American-owned cable systems at present are vitally deficient from the standpoint of giving America independent communication with other countries. The Central & South American Telegraph Co. has asked the department's assistance with regard to extending its cable connection from Buenos Aires northward to Rio de Janeiro. Certain other interests are asking aid in the establishment of a system linking Cuba and Porto Rico to Key West, Fla. The Western Union Telegraph Co. is requesting aid to install a cable direct from New York to Rio de Janeiro.

As it happens, however, no armored or deep sea cable is made in the United States. Consequently this nation is dependent upon England for every foot of cable it may wish to lay. Naturally England has refused at this time to permit the sale of any of this cable to American interests. It is necessary to make certain investigations looking to the question of either securing the cable needed to lay in the interest of American commerce or to advise American manufacturers upon what terms and conditions they can go into the manufacture of cable themselves.

Pointing out that the United States has not developed as it should in the way of establishing American banks in foreign countries, a merchant marine and a consular and diplomatic service, Senator Underwood said unless these things were done we would have idle factories and idle furnaces in the near future. Referring to the iron and steel industry, he said that everyone knows that its expansion in this country has far exceeded the American demand.

Collective Bargaining at Bethlehem

Company Admits Jurisdiction of War Labor Board and Agrees to Enter Into Conference With Employes to Fix Details—Asks Government for Additional Allowances to Pay Retroactive Wages Awarded by Board

DIFFERENCES between the war labor board and the Bethlehem Steel Corp., were adjusted at a meeting of the board in New York, Feb. 4. The jurisdiction of the board which previously had been decided by the Bethlehem company, on that occasion was admitted by its counsel. Counsel for the corporation requested the board to obtain from the government additional allowances on contracts, so that it could pay retroactive wages under the board's awards, and the board gave assurances that such recommendations would be made. The statement of Paul D. Cravath, counsel for the Bethlehem Steel Corp., and voicing the latter's recognition of the board's position as to wage awards and collective bargaining, was as follows:

"It has not been the disposition of Bethlehem to disregard the findings of your board nor to take advantage of the signing of the armistice to withdraw from the assurances which it gave you during the war period. On the contrary, the company authorizes me to say that it recognizes that you are entitled to its loyal co-operation in carrying through the two important measures with which your findings dealt:

"First, the inauguration of an effective plan for collective bargaining between the management and the employes, and second, the doing of all that can be done to secure from the war and navy departments and the other procurement departments of the government an allowance to cover such additional compensation as may be necessary to give Bethlehem employes the retroactive pay recommended by your findings.

Believes in Collective Bargaining

"The company, therefore, authorizes me to say that it will at once invite the committees of our employes heretofore elected to meet and enter into a conference with the management regarding the details of the plan and such other matters as may seem to these committees to require discussion with the management.

"I am assured and I believe that the Bethlehem management will loyally carry out the policy here outlined. Not only is it anxious to make good the assurances given to your board, but it has become a firm believer in collective bargaining and anxious that it should be successfully put into effect at all its plants.

"We fully appreciate that your board is under a responsibility to Bethlehem employes to see that a fair system of collective bargaining is installed. To that end the company will be very glad to furnish you from time to time with any information you desire regarding the measures it is taking, and, of course, our employes do not require our consent to resort to your board in case they should feel that the action of the management in respect to collective bargaining does not seem to them to be in accordance with the principles laid down by your board."

The board announced after the meeting that no further action would be taken for the present. Opportunity will be given the corporation to test the practical character of its proposals and its full compliance with the spirit of those proposals as interpreted by the board.

How Britain Handled War-Labor Problem

WASHINGTON, Feb. 11.—British methods of handling the war industries have been explained by the United States department of labor through its training and dilution service. When the United States entered the war, the training and dilution service of the labor department was assigned to study foreign methods in industrial war work, with a view to the possible establishment of some method in this country on a similar basis.

A study of British methods showed that five instructional factories operated by the British ministry of munitions produced 800 operatives, largely trained to be instructors, every six weeks. Technical schools, operating in conjunction, provided 500 trained workers a week, and during the war trained more than 50,000 men and women. The vestibule training departments of the manufacturers, with the co-operation of the trade unions, trained more than 10 times as many as all the government agencies together.

In April, 1915, after nearly a year of war, it was announced that Lloyd George would head a board "to organize the national output of munitions of war," and about a month later, at the time of the formation of the coalition cabinet in May, 1915, a ministry of munitions was created with Lloyd George as its chief. A munitions bureau was organized; all factories making war materials were placed under control of the government; skilled workmen at the front were recalled to work in munition plants; men in the colonies and in the United States experienced in making munitions were offered free transportation to England; a suspension of union rules was urged, and finally, in June, 1915, the munitions of war act was passed.

Strikes Prohibited

This bill prohibited strikes and lockouts in war industries, substituted compulsory arbitration, and suspended all trade union rules "calculated to hamper production." On the other hand, as a concession to labor in recognition of the sacrifices the workers were making, the profits of the employers were limited, and excess amounts reverted to the national treasury.

Provision also was made, under the act for recruiting among trade union members, for a voluntary army of workmen who would sign agreements to work wherever their labor was needed. The existing local munitions committees were transformed into "labor courts," with power to fine individual workmen for "slacking," for infraction of the agreements signed by them as members of the voluntary army of workmen and for any offenses tending to hamper production, and, further, with the power to make decisions in regard to changes in existing wage rates.

Under these rules the ministry of munitions found itself confronted with threatened war at home while engaged in mobilizing its forces for war in France. The British method of coping with the problem of labor unrest during the war was developed through conferences attended by representatives of the labor unions, employers and the government. Such a conference in March, 1915, resulted in the "Treasury Agreement," which

was embodied in the munitions of war act of July 2, 1915. That act covered practically every relation of labor to things manufactured for war purposes. Features of the "Treasury Agreement" were as follows:

The minister of munitions was empowered to control all factories engaged principally in war work, his power extending to the right to take the plant over in the event of mismanagement.

Power was given to limit the profits of factories to an increase of 20 per cent above the average profits for the two preceding years.

Wages of employes were fixed as of March, 1915, any variation to be with the consent of the minister of munitions.

The committee on production was established to meet at least three times a year to hear evidence on the cost of living. If the cost was found to have increased, employers were ordered to pay a bonus to their workers, which advance was later paid by the government.

Strikes became illegal; arbitration compulsory.

The ministry of munitions through this agreement ironed out many labor difficulties, and now wields tremendous influence in the British government.

Shipyard Workers Strike

Philadelphia, Feb. 11.—Four thousand metal workers struck at the shipyards of the Merchant Shipbuilding Corp. at Bristol, Pa., Saturday, as a result of a dispute over whether a foreman should be a member of the labor union. The strikers include boilermakers, angle and plate shop workers, riveters, etc. The union has made an appeal to the war labor board at Washington. The corporation issued a statement that it emphatically disclaimed any objection to a man holding membership in a union, but it pointed out its belief that it is impossible to have a foreman, who participates in the management of a corporation, to properly represent its interests when so closely identified with the men who are subject to his orders.

Supplies Plant Physicians

The demand upon the newly established working conditions service of the United States department of labor, for industrial physicians and surgeons, has grown so rapidly that the service has been compelled to establish a bureau of registry of physicians specially skilled in this phase of medical and surgical work, according to a bulletin issued by the service. The new bureau is prepared to furnish industries with the names of skilled industrial medical advisers on request. In each instance the service satisfies itself of the training of the physicians before their names are allowed on the list. Thus, only those best qualified are listed and manufacturers have the advantage of knowing that by availing themselves of this service their dispensary section will be in competent hands.

What Does Reconstruction Mean

BY G. H. JONES

Vice President, Inland Steel Co., Chicago

WHAT does Reconstruction mean? What is it? It is spoken of glibly enough by those who talk to or write for the public, but do any two agree as to what his share of it is? Is it not something that a national consciousness will develop, or is it something concrete and definite that has not yet been defined by any one of our public men?

It should mean a new feeling of responsibility to all. To seize the opportunity that now offers to bring about a better understanding and better co-operation between all classes of society. The sentiment is strong within us to do good, and our sympathies are stirred to the utmost; to be better citizens and men than we have been; to share with others our labor or our services, our worldly goods or money. We cannot all be made alike, as some dreamers claim. We have different mental and physical powers and different heredity. All count in the long run and place us where we can serve to the best advantage, provided all have the same opportunities and are safeguarded in them.

It is a new spirit in the United States, and the duty of all to see that the foreigner who comes to our shores, with high hopes and high resolves, is not disappointed and is given merely a good wage and no enlightenment. He must be taught and know the language to be able to hear and read what he should, and he should be looked after otherwise and cared for, properly housed and helped to work suited to him, not left to be preyed upon by wrong thinkers who poison his mind, and not too lightly thrown on one side when his labor is no longer needed. He must be educated to be a true citizen of this republic and not be permitted to return to his native country, with some money, but with little or no information about our institutions.

Reconstruction means broadly a new world. The big men are now working out the details in France in the peace conference and they will be successful, notwithstanding some slight differences which now apparently exist. We must do our share here in supporting their ideals and letting them know we are doing so.

Let us all get together. Tell each other our troubles which are never as bad as they seem. Helpful counsel will accomplish much and teach mutual self-respect.

Business and manufacturing must not only show a profit—it must be yoked up with the progress of the race—to make men better fed and better clothed and happier in many of several ways.

Here and There in Industry

TERMINATION on Dec. 11, 1918, of the leasing arrangement made by the Benjamin F. Shaw Co., Wilmington, Del., with E. I. duPont deNemours and Co., to facilitate the construction of the United States government's powder plant at Nashville, Tenn., left the company in a bettered condition to take care of all classes of high pressure piping construction work. The Shaw company now has the new pipe shop, 50 x 250 feet, equipped with new electric-driven pipe machines of late design, which was erected during the war.

* * *

AS a result of the cancellation of government contracts, the International Steel & Ordnance Co., Lowell, Mass., suspended operations on Jan. 25. During the war, the company employed 700 persons.

* * *

NORTON Co. and the Norton Grinding Co., Worcester, Mass., have ordered 100 bicycles which they will sell on easy terms to their employes, in view of the fact that street car fares are to be raised to 7 cents in that city Feb. 9.

* * *

PLANS are being prepared by the Wilmington Casting Co., Wilmington, O., manufacturer of light gray iron castings, for a fireproof pattern storage vault. It is in the market for such equipment as steel shelving, steel lockers, etc.

* * *

TO be used in the heat treatment of seamless tubes for the aircraft division, the American Metallurgical Corp., Philadelphia, engineer, is installing a 225-kilowatt vertical heat treating furnace of General Electric design in the plant of the Ohio Seamless Tube Co., Shelby, O.

* * *

THREE branch plants are to be opened in Texas and Oklahoma by the Products Supply & Tool Co., Marietta, O. The company recently increased its capital for this purpose. The company is a jobber in oil well machinery and supplies.

* * *

THE Drake Process Machinery Co., 1255 West Fourth street, Cleveland, is seeking a plant equipped for the manufacture of automatic equipment. The company recently increased its capital from $300,000 to $400,000 and is licensed to operate in practically every state in the union.

* * *

REPORTS that the Allen S. Davison Co., Pittsburgh, had purchased the West End furnace at Roanoke, Va., proved erroneous. The Davison company was negotiating for the furnace, but abandoned the purchase when it learned that the furnace was under lease and immediate possession could not be obtained.

* * *

ARRANGEMENTS have been completed, whereby the Standard Steel Car Co., New Castle, Pa., will purchase from the government machinery and equipment it can use. This equipment has a total value of $1,000,000 and was bought by the government for use at the company's plant.

* * *

ANCHOR chains to supply 40 vessels have been ordered by the United States shipping board's Emergency Fleet corporation from the Seattle Chain Co., Seattle. Approximately 1250 tons of steel will be required to fill the order and it will take about one year to complete the contract.

* * *

A LARGE crushing plant for supplying fluxing stone is being erected for the Lime & Stone Products Corp., Hamburg, N. J., and a gyratory crusher is being installed It is expected the new plant will be in operation within 90 days. The company recently increased its capital from $600,000 to $700,000.

* * *

METAL stampings, steel barrels and drop forgings will be among products soon to be made by the Canadian Cartridge Co., Hamilton, Ont., according to announcement of Sir Frank Baillie, Toronto, its president. The plant already is making steel, steel barrels and will begin making the other products within a few weeks.

* * *

THE Brightman Mfg. Co., Columbus, O., manufacturer of turned shafting and superior cold finished nuts, has discontinued the representation arrangement in New York territory which it has had with the Mayer & Clarkson Co., Buffalo. This district will now be handled by the Superior Sales Co., Charles A. Ingle, Rochester, N. Y.

* * *

A CLAIM has been filed by the Donner Steel Co., Buffalo, with the interstate commerce commission for $498,000, against Director General Hines and the Lackawanna, Erie, Lehigh Valley, and New York Central railroads. The claim alleges that the Donner company was obliged to carry on a switching service which was furnished its competitors free of charge.

* * *

WITH an increase in capital stock, the New Way Husker Co., Greenville, O., formerly the Great Eastern Roller Co., will build extensive additions to its factory buildings. It has purchased the patent rights on a new way corn husking machine which it expects to manufacture and market in connection with its present line of soil pulverizers, harrows, farm gates, etc.

* * *

NEW equipment to be purchased by George Lewis, Homer, La., includes machine tools, transmission apparatus, etc., as follows: Steam engine 15 to 40-horsepower, with throttling valve and side crank; new or second hand 50-inch circular saws; piping ¼ to 2-inch; boiler grates and fronts, smoke stack material, cotton gin machinery and appliances as well as mill supplies.

* * *

IN a recent letter, Henry H. Kur, vice president of Westinghouse, Church, Kerr & Co., New York, said: "We believe that an era of great prosperity is at hand, a period of industrial expansion and building activity. War plants will be adapted to the production of articles of peace; plants denied permission during the war will now expand; new factories and shops will be built."

* * *

DESIGNED for marine use, the Kahlenberg Bros. Co., Two Rivers, Wis., recently shipped to New Jersey the largest engine of the semi-diesel type, burning crude oil, which it has ever built. The engine has three cylinders and is rated at 150 horsepower. One of its main features is the simplicity of control by means of a short lever, less than 12 inches long.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

GEORGE EVERTON DIX, newly associated with the Consolidated Steel Products Corp., 165 Broadway, New York City, was born at New Brighton, Staten Island, Feb. 13, 1878. He was educated at the Staten Island academy. Mr. Dix has been associated with the iron and steel industry for many years. From 1907 to 1915 he was connected with the Carnegie Steel Co. He then became associated with the Central Steel Co., Massillon, O., and after a period of about six months, left to enter the services of the Midvale Steel Co., Philadelphia. He was head of the structural division of the general sales department.

J. H. Fitch Jr. has been made assistant general manager of sales of the Liberty Steel Co., Warren, O.

W. H. Luhrs, general manager and a director of the General Aluminum & Brass Co., Detroit, has resigned.

John G. Rumney has been re-elected president of the Detroit Steel Products Co., Detroit.

O. P. Blake, who was Washington representative of the Inland Steel Co., Chicago, during the war, has resigned.

Lewis H. Jones has been re-elected president and general manager of the Detroit Copper & Brass Rolling Mills, Detroit.

Judge E. H. Gary, president of the United States Steel Corp., left New York Feb. 6 to spend several weeks in Florida.

Dr. Richard Moldenke was the speaker at the New England Foundrymen's association meeting, Feb. 12. The subject of his address was "Foundry Melting Methods."

Hugh F. Taylor, president of the Union Wire & Iron Co., Cleveland, is mentioned as the next independent Republican mayorality candidate in that city.

A. J. McDonald, former purchasing agent of the Marlin-Rockwell interests at Philadelphia, has been appointed sales manager of the Lebanon Steel Foundry, Lebanon, Pa.

F. D. Hoerle has been appointed manager of sales at Detroit for the Donner Steel Co., Inc., Buffalo, which recently opened a district sales office in the Penobscot building in that city.

W. W. Wallace, formerly with the Hussey-Binns Steel Co., Pittsburgh, has been made steam and hydraulic engineer with the Pittsburgh Crucible Steel Co., Midland, Pa.

A. J. Kinnucan has been made Detroit district manager for the Electric Steel Co. of Indiana, Indianapolis, in its recently opened office in the Penobscot building, Detroit.

W. R. Willett, general manager of the Chevrolet Motor Co., Bay City, Mich., plant, has been selected to take charge of the General Motors Co. new Chevrolet plant in Detroit.

GEORGE E. DIX

F. A. Sindeband, of Robert Grant, Woolworth building, New York, has left for the Far East to establish offices in Shanghai. Mr. Sindeband only recently completed a trip of investigation in the Orient.

H. N. Curd, manager of the Lenoir Car Works, Lenoir City, Tenn., has resigned to accept a similar position with the Pacific Car & Foundry Co., operating plants at Seattle and Portland, Oreg.

Joseph C. Baldwin Jr., has been elected a director of the National Conduit & Cable Co., New York, to fill the vacancy caused by the death of Capt. J. R. de Lamar. W. S. Eckert has been elected vice president of the company, in charge of sales.

Howard J. Bowie has been appointed purchasing agent for the Variety Iron & Steel Works Co., Cleveland, to succeed J. B. Bradford, who resigned to go to Chicago to become affiliated with the Joliet Bridge & Iron Works.

R. D. Love, formerly with the Betz-Pierce Co., Cleveland, who recently returned from a military training camp, now is connected with the sales organization of the United Alloy Steel Corp., Canton, O.

Joseph N. Anderson Jr., has been elected a director of the Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, to serve out the unexpired term of the late Maj. Joseph T. Speer.

J. T. Dougherty, superintendent of the Mercer works of the American Sheet & Tin Plate Co., is on his way to California where he will spend the next two months convalescing from his recent illness.

J. B. Bartholomew was recently elected a director of the Peoria Malleable Castings Co., Peoria, Ill., when the board was increased from eight to nine members, the other eight being re-elected.

J. P. Williams has been made sales manager of the Pratt & Letchworth Co., Buffalo, manufacturers of steel and malleable castings, succeeding G. P. Warner who recently resigned.

J. F. White has been made manager of the Lima, O., branch of the Holland Furnace Co., and has removed from his former residence at Detroit. O. H. Giersbrook has left the Lima branch to become manager of the Boone, Iowa, branch.

L. H. Thullen was elected president of the Grand Rapids Brass Co., Grand Rapids, Mich., at a recent meeting of the board of directors. J. Murray was made vice president and Carlton Austin, secretary and treasurer. A year ago Mr. Thullen came to Grand Rapids to become manager for the company and he recently obtained stock control. He is a leading engineer and has obtained over 75 patents on railway signalling devices. He is a member of the American Society of Mechanical Engineers, the American Institute of Electrical Engineers and the Franklin Institute.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

THOMAS H. MATHIAS who was made general superintendent of the Lackawanna Steel Co. Jan. 1, had served as assistant general superintendent since January, 1909. In the latter capacity he has been succeeded by George A. Whitehead. Mr. Mathias has been associated with the operating department of the Lackawanna Steel Co. since January, 1905, when he resigned his position in charge of roll designing and roll turning with the Illinois Steel Co. He served in a similar capacity with the Lackawanna Steel Co. until his elevation to assistant general superintendent. Mr. Mathias has enjoyed a high reputation as an expert on roll designing and roll turning. He began his iron and steel career in 1886, as an apprentice in the South Chicago works of the North Chicago Rolling Mill Co., which subsequently was taken over by the Illinois Steel Co. He is a native of Hamilton, Ont. Mr. Mathias comes from a remarkable steel family. His father, D. S. Mathias, was consulting engineer at the South works of the Illinois Steel Co. at the time of his death about a year ago. One brother, D. R. Mathias, is superintendent of the Joliet works of the Illinois Steel Co., and another brother, W. G. Mathias, is assistant to the vice president of the Tennessee Coal, Iron & Railroad Co.

J. W. Flannery has been appointed to represent the Corcoran Mfg. Co., Cincinnati, in the east. The Corcoran company manufactures automobile parts and specializes in hoods and radiators for Ford cars.

E. L. Parker, president of the Columbia Steel & Shafting Co., Pittsburgh, is reported to be making splendid progress toward recovery from an operation for appendicitis which he underwent recently at the Homeopathic hospital, Pittsburgh.

George W. Hite, for 10 years a member of the sales force of the Pittsburgh Iron & Steel Foundries Co., Pittsburgh, and who relinquished that position Aug. 1, 1918, to enter the ordnance production division of the war department at Washington, has retired from the government service. On Feb. 1 he contracted for 10 years with the Pittsburgh Steel Foundry Co. to manufacture his own invention known as Vacromite, a patent for which has been applied for. This invention of Mr. Hite's is a steel alloy and was made after a study of mill conditions covering a period of eight years.

Shin Nakahara, of the Imperial Steel Works, engineers, Yawata-Shi, Japan, and Baron Chuzo Mori, civil engineer, Imperial Government Railways of Japan, Tokyo, were in the Birmingham district the past week, inspecting the railroad operations of the district and also steel works, blast furnaces and other operations of the Tennessee Coal, Iron & Railroad Co., subsidiary to the United States Steel Corp.

A. W. Williams recently resigned his connection with the main office of the Midvale Steel & Ordnance Co. and the Cambria Steel Co., Philadelphia, to become associated with the Worth Steel Co., Claymont, Del., in the latter's sales department. Mr. Williams originally was identified with the Worth Bros. Co. at Coatesville, Pa., but the latter was taken over by the Midvale Steel & Ordnance Co.

F. W. Reisman has been placed in charge of the recently opened branch office in Providence, R. I., 302 Turks Head building, of the Quigley Furnace Specialties Co., 26 Cortlandt street, New York. Mr. Reisman has been the Quigley company's eastern representative for hytempite fire brick cement and insulating brick as well as the air manufactured by this company for distributing transport system powdered coal and other fuels.

L. G. Knight has been made manager of sales in the eastern territory for the Pacific Coast Steel Co., Seattle. His headquarters are at 52 Broadway, New York. He has been connected with the company's home office for several years. He now will have jurisdiction over sales in the east of products from the Seattle as well as San Francisco mills and from the plant now being built at Portland.

D. R. Black has been made southern district sales manager for the Central Iron & Steel Co., Harrisburg, Pa. He will have charge of the southern territory with offices in the Continental building, Baltimore. Mr. Black formerly was with the Illinois Steel Co., Chicago, but for the past year and one-half has been connected with the sub-committee on steel distribution of the American Iron and Steel institute at Washington.

Edward A. Niven has been appointed sales agent for the Buffalo district for the American Steel & Wire Co. He will have his headquarters at 337 Washington street, Buffalo. Mr. Niven was traveling representative of the company in New England before taking the Buffalo position. He succeeds Allan Frazer, who went to New York as eastern sales manager of the Wickwire Steel Co.

George F. Kull, Appleton, Wis., has been appointed executive secretary of the Wisconsin Manufacturers' association, with headquarters in the Milwaukee Association of Commerce building, Milwaukee. At the recent annual meeting of the state association, William George Bruce, Milwaukee, declined re-election as secretary, due to the growth of the duties to the point of requiring a paid secretary-manager. Mr. Kull is a former newspaper man.

T. A. Whitworth, formerly owner of the Dreadnought Co., Cedar Falls, Iowa, which manufactured steel gates, now is sales manager of the Sioux Falls Metal Culvert Co., Sioux Falls, S. Dak., which recently took over the business of the Dreadnought Co. C. N. McMillan, secretary of the Sioux Falls Metal Culvert Co., will continue at the head of the business as general manager, devoting more of his time than formerly to the buying and general interests of the company.

Lieut. C. A. Carpenter, who from the entrance of America into the war was attached to the Pittsburgh district office of the ordnance department, recently retired to private life and has become auditor of the Valley Forging Co., Verona, Pa. Just prior to entering the army, Lieutenant Carpenter was chief engineer of the Quasi-Arc Weldprode Co., New York City, and before that for several years was general foreman of the Camden Iron Works, Camden, N. J.

Men of Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

E. J. PARKER has just returned from the Orient after an 18 months' experience in the machinery markets of Japan, China and the Philippine islands. Mr. Parker states that there is a bright prospect for American equipment and engineering ability throughout Japan and China. In both these countries he found prospective buyers in a friendly mood toward American manufacturers. The field, however, is one that like every other, requires intensive cultivation and a willingness to conform to the methods in use, he says. Mr. Parker for many years was connected with the Morgan Engineering Co., Alliance, O., in both its engineering and sales departments, and made several trips to Europe in the interests of this company. Since his return to the United States he has organized the Parker Co., which has opened head offices at 165 Broadway, New York, for conducting a general engineering and contracting business, with particular reference to exporting and importing. This company already has offices in operation at Yokohama, Shanghai, San Francisco and Harbin.

Gen. Guy E. Tripp, chairman of the board of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., sailed for Europe recently on the CARONIA for a business survey.

D. R. Crissinger was elected director of the Marion Steam Shovel Co., Marion, O., at its recent annual meeting. He fills the vacancy caused by the death of B. P. Sweeney.

R. C. Forbes now is in charge of the Chicago sales office at 646 Peoples Gas building, of the Browning Co., Cleveland, which office was closed for the duration of the war.

C. R. Heimerdinger has been appointed Cleveland representative at 420 Prospect avenue for the L. & I. J. White Co., Buffalo, manufacturer of shear blades and machine knives.

R. J. Brown, former production manager of the Westinghouse Air-brake Co., East Pittsburgh, Pa., was recently appointed production head of the Hollis Tractor Co., Tiffin, O., which commenced operations Feb. 15. W. H. Roe is the company's mechanical engineer.

H. P. Eilers, who for 17 years has conducted a machinery business in New York, has removed to Los Angeles where he intends to operate along the same line, making that city his permanent home.

N. A. Booze, who for a number of years was secretary of the Machinists Supply Co., Chicago, has become affiliated with the Federal Machinery Sales Co., 12 North Jefferson street, Chicago, effective Feb. 17.

C. G. Hamilton, manager of the machine tool department of Fairbanks, Morse & Co., 30 Church street, New York City, has accepted a position with the Vacuum Oil Co., of that city.

Charles A. Ingle, of the Superior Sales Co., Rochester, N. Y., now represents the Brightman Mfg. Co., Columbus, O., manufacturer of turned shafting and cold finished nuts, in the New York territory.

Samuel H. Moon, Louisville, Ky., formerly manager of the Ahrens & Ott plant of the Standard Sanitary Mfg. Co., was elected vice president at the company's recent annual meeting. Theodore Ahrens was re-elected president.

W. A. Buell has been made sales engineer of the Barber-Greene Co., Leader-News building, Cleveland. He formerly was conveyor engineer of the Goodyear Tire & Rubber Co. H. W. Cudding has been made auditor. He formerly was general auditor of the Lyon Metallic Mfg. Co.

C. E. Stamp, head of the Charles E. Stamp Co., Cleveland, builder of electric traveling cranes, etc., who was released from service with the crane section of the war industries, when that body disbanded, has returned to his official duties with his company.

Gustave Huette, who founded the Falls Machine Co., now the Falls Motors Corp., Sheboygan Falls, Wis., about 25 years ago, has retired from all connection with the company. About three years ago Mr. Huette disposed of the controlling interest to Andrews & Co., but continued to serve as president until recently, when he disposed of his remaining interest. Mr. Huette is regarded as one of the ablest and most successful machinery manufacturers of Wisconsin.

Prof. George I. Alden, president of the Norton Co., and Norton Grinding Co.; John F. Tinsley, general manager of the Crompton & Knowles Loom Works, and Charles F. Marble, treasurer of the Curtis & Marble Machine Co., all of Worcester, Mass., have been elected president, vice president and clerk respectively of the Worcester Trade schools.

L. B. Cravath, after 12 years' experience in the farm tractor and implement business, recently was elected by the directors vice president of the Hession Tiller & Tractor Corp., Buffalo. A few months ago he joined the Hession organization as sales manager. His promotion to the general managership followed and a short time ago he was made a director.

Alvin Vogt is the last of three officers of the Vogt Bros. Machine Co., Louisville, Ky., to receive commissions in the United States army. He became second lieutenant upon being graduated from a training school at Camp Taylor, Ky. Clarence W. Vogt is a captain in France and Ernest L. Vogt is a first lieutenant.

E. H. Ruck has been appointed chief engineer for the Automotive Corp., Ft. Wayne, Ind. He formerly was chief engineer for the Cleveland Tractor Co., Cleveland. He has been connected with the manufacture of automotive machines for more than seven years. He is a member of the American Society of Mechanical Engineers and of the Society of Automotive Engineers.

Lieut. Frank Wollaeger Jr., ordnance corps, has received his honorable discharge and resumed his position as secretary of the Kempsmith Mfg. Co., Milwaukee, milling machine manufacturer. Lieut. Wollaeger entered the service a year ago and was commissioned just before the armistice was signed. He was stationed at Frankfort arsenal, Philadelphia, in the division of optical gun sights.

Obituaries

JAMES L. ORR, president of the Orr Iron Co., Evansville, Ind., died Feb. 5 at the age of 81. He was born in Evansville Oct. 31, 1838, and spent his entire life in that city. He came from a Scotch-Irish family, his father, Samuel Orr, emigrating from Ireland to America in 1834 and settling in Pittsburgh. Samuel Orr was attracted to the iron business while in Pittsburgh and in 1835 located at Evansville and engaged in the iron business under a partnership consisting of Alexander Laughlin and James Laughlin, of Pittsburgh, and himself. He died in 1882 and a new partnership was formed under the name of Orr, Griffith & Co., which in 1900 was changed to the Orr Iron Co. James L. Orr retired from active business in 1912. His son, Samuel L. Orr is now one of the active managers of the Orr Iron Co.

Walter Henry Gill, president of Philip H. Gill & Sons, machinists, with a plant at Erie Basin, Brooklyn, died Feb. 3 at his home in Brooklyn, aged 53.

Frederick Townsend Huddart, well known in the iron and steel business on the Pacific coast, died Jan. 12 at the Lane hospital in San Francisco. He was a member of the firm of Huddart, Gunn & Co., that city.

William H. Ellis, founder and head of the William H. Ellis & Son Co., East Boston, Mass., builder of wharfs and bridges, died suddenly on Main street in Charlestown, Mass., Feb. 3, aged 60 years.

John J. Murphy, 60 years old, one of the oldest employes of the firm of Booth & Flinn & Co., having been superintendent of construction for that company for many years, died at his home in Pittsburgh, Feb. 2.

William J. Slattery, a department head of the United States Steel Products Co., died of heart disease, Feb. 3, in a Brooklyn hospital, aged 67. Mr. Slattery formerly was connected with the Pittsburgh Wire Co.

John Follett, for several years superintendent of the Fales & Jenks Machine Co., Pawtucket, R. I., until his retirement, died at his home in Cumberland, R. I., Feb. 3, from bronchial pneumonia, aged 77 years.

Joseph Hall Cotton, treasurer and a director of the American Tube Works, Somerville, Mass., died suddenly at his home in Boston from an attack of acute indigestion, Feb. 6, aged 50 years. When 17 years old he went to work for the American Tube Works, of which his father, George H. Cotton, was formerly president. He learned the business thoroughly and at one time was president of the works. He had been treasurer since 1913.

Mathias R. Vanderkloot, president of the South Halsted Street Iron Works, Chicago, died Jan. 29, aged 58 years, from heart trouble. He was born in Holland and came to America at the age of six years, having been a resident of Chicago for 52 years.

Henry J. Lillich, who for the past 18 years has been attached to the contract department of the Jones & Laughlin Steel Co., Pittsburgh, died Feb. 6, at the Mount Alto sanitarium, where he had been a patient for six weeks. He was 37 years old and made his home in Ingram, Pa.

Jacob R. Confer, 60 years old, superintendent of the Schoenberger works of the American Steel & Wire Co., Pittsburgh, died Jan. 31 at his home in Pittsburgh following a short illness. He was born in Springdale, Pa., and had been with the American Steel & Wire Co. since 1894.

Simpson Musgrave, at one time superintendent of the Lucy furnace of the Carnegie Steel Co., and subsequently with the Jones & Laughlin Steel Co. at Woodlawn, Pa., died at his home in Pittsburgh, Feb. 5. Mr. Musgrave was born in Ireland 76 years ago, coming to Pittsburgh when a boy.

F. C. Sauer of the Cleveland district ordnance department, died in Canton, O., Jan. 30. He was a mechanical engineer, born in Alsace 38 years ago. Since he came to this country at the age of 22, he had been associated with the Herring-Marvin Safe & Lock Co., Hamilton, O., and the Diebolt Safe & Lock Co., Canton. When the district ordnance office was organized he volunteered his services and for six months had been in charge of the trench warfare section, procurement division. His home was in Hamilton.

John Cincinnatus Wilson, president and treaurer of the Smyth Mfg. Co., booksewing machines, president of the Sigourney Tool Co., both of Hartford, Conn., and president and treasurer of the Pickering Governor Co., Portland, Conn., died suddenly at his home in Hartford, Jan. 23, aged 54 years. He was in his usual good health the day previous.

Charles Smith, Belleville, N. J., died at his home recently after a long illness. He was born in Yorkshire, Eng., and came to this country with his parents when he was but four years old. He was associated with the wire trade since boyhood and for 25 years was secretary of the Eastwood Wire Mfg. Co., and was president of the American Perforated Metal Co.

E. J. Howard, aged 78, president of the Howard Ship Yards, Jeffersonville, Ind., died of paralysis Jan. 30 at Port Fulton, a suburb of Jeffersonville. The shipyards were established by Mr. Howard's father at Madison, Ind., but were located at Jeffersonville in 1848 and have been in continuous operation ever since. The business was incorporated in 1903.

Lieut. Stephen T. Hopkins, Newtonville, Mass., of the 96th Aero Squadron, who was killed in action at St. Mihiel, France, was assistant treasurer of the Becker Milling Machine Co., Hyde Park, Mass., at the time he enlisted in the aviation service at the army aviation school at the Massachusetts Institute of Technology. He was reported missing in action Sept. 12. He was 26 years old, and a graduate of Harvard in 1914.

Ebenezer C. Hay, of Newark, N. J., who died recently, was prominent among American iron and steel fabricators and manufacturers of iron building material. He was 81 years of age and was president of the Hay Foundry & Iron Works, Newark. His father, James B. Hay, came to Newark from Edinburgh, Scotland, as a young man and started a foundry in 1830 in a small structure. When the firm began to receive contracts for structural steel for various buildings, the business branched out. E. C. Hay joined his father in the business as a boy after graduating from a private school. In turn the latter's sons, John Lewis Hay and James Bruce Hay, were associated with him in the business.

More Light Shed on New Tax Law

Normal Taxes and Surtaxes Payable in Peace and War Time Compared—Questions Perplexing Readers of *The Iron Trade Review* Answered—Passage of Act as Agreed on by Conferees Indicated

INCOME TAX DEPARTMENT
Conducted by
WOLFF, MILLER & CO.,
Certified Public Accountants
1328 Broadway, New York City

INDICATIONS point to the adoption of the draft of the new revenue act as agreed on Feb. 6 by the senate and house conferees. If any change is made it probably will be only in the reduction or elimination of some of the luxury taxes. The figures forming the basis of this as well as the previous articles, therefore, reasonably may be considered as final.

The following table affords a ready comparison between the normal taxes payable by a married man, with no children, and with $2000 to be exempted, for the years 1916 (during peace), 1917, 1918 and 1919 to provide for war expenditures:

Net income	1916	1917	1918	1919
$5000.....	$20	$80	$180	$120
10,000.....	120	280	720	480
20,000.....	320	680	1920	1280
40,000.....	720	1480	4320	2880
60,000.....	1120	2280	6720	4480
80,000.....	1520	3080	9120	6080
100,000.....	1920	3880	11,520	7680
150,000.....	2920	5880	17,520	11,680
200,000.....	3920	7880	23,520	15,680
300,000.....	5920	11,880	35,520	23,680
500,000.....	9920	19,880	59,520	39,680
1,000,000.....	19,920	39,880	119,520	73,680

For 1919 the normal taxes for an individual will be about one-third less, as the rates will be 4 per cent and 8 per cent, instead of 6 per cent and 12 per cent. The normal tax payable by a corporation for 1919 will be five-sixths of the tax for 1918, as the rate will be 10 per cent instead of 12 per cent.

A comparison of the surtaxes in the different years will also be interesting, as it will enable an individual to compare his total tax according to his income in each year.

Taxable income	1916	1917	1918	1919
$5000.....	....	....	....	....
10,000.....	....	75	110	110
20,000.....	....	500	710	710
40,000.....	200	2100	3410	3410
50,000.....	600	4500	8110	8110
80,000.....	1200	7900	14,810	14,810
100,000.....	2,000	12,300	23,510	23,510
150,000.....	4500	25,800	49,510	49,510
200,000.....	7500	41,300	77,510	77,510
300,000.....	15,000	80,800	137,510	137,510
500,000.....	33,000	172,800	263,510	263,510
1,000,000.....	83,000	435,300	583,510	583,510

It will be seen from the above that the rates for the present and the next year are considerably higher than they have been during the previous years. The normal tax for 1917 was about double for 1916, while surtaxes were approximately five times as great in 1917 as in 1916. Of course, the great increase is attributable to the entry of the United States into the war. In turn, the normal tax for 1918 is practically triple the 1917 rates, while surtaxes are also considerably higher than in former years. The higher the income, the higher the rate of tax, so that in 1918 while an income of $10,000 pays only 11 per cent tax, an income of $200,000 pays 50 per cent tax, and that of $1,000,000 an assessment of 70 per cent, as shown in our first article. This leads us to again impress upon the business man the great importance of exercising more care than ever in the interpretation of the books of account. What in former years was comparatively an inconsequential matter, such as for instance the correct classification of capital expenditures, means dollars and cents in tax computations today.

To illustrate, if items properly chargeable as "plant and machinery" were through error charged to buildings, the amount of depreciation would be affected, as buildings are subject to 2 per cent or 3 per cent, as against 5 per cent and up for plants. In large plants, such errors resulting in insufficient deductions from income would result in an overpayment of taxes. This is important not only during 1918, but will continue to be so, as taxes for individuals and partners especially will not be reduced very materially in the future. This phase will receive more extended treatment in a succeeding article.

Questions and Answers

QUESTION: As subscribers of the IRON TRADE REVIEW, *we would be pleased if you would compute our income tax for* 1918. *We have been a Minnesota corporation since* 1900. *Invested capital for* 1918, $402,500; *net earnings for* 1918, $123,000; *invested capital prewar period*, $255,000; *average profits prewar period*, $85,000. *What is your idea of our income tax and when do we have to pay this tax?*

ANSWER: The following table gives in detail the calculation of your taxes, the total of which is $50,789.20. Deducting this from your total income of $123,000, would leave $72,210.80 surplus, available for dividends. When these dividends are paid to your stockholders, the recipients would, of course, have to pay surtaxes on their individual share. You will note that the calculation is on the basis of "excess profits tax," which is greater than the amount under the "war profits tax" method. Therefore, in making the computation, it is unnecessary in this case to take account of the invested capital and averaged profits during the prewar period.

WAR EXCESS PROFITS TAX (Excess Profits Method)

Excess profits credit:		
8 per cent of invested cap'tal ($402,500)....		$32,200
Specific exemption		3,000
Total credit on amount of income exempt		$35,200
Amount of net income taxable as follows: ($123,000 — 35,200 = $87,800)		
Amount in excess of credit and not greater than 20 per cent of invested capital:		
20% of invested cap. ($402,500)	$80,500	
Less excess profits credit as above.	35,200	
Bal. (1st brack.)	45,300	30% $13,590
tax. (sec. bracket).....	42,500	65% 27,625
Total income	$123,000	
Excess profits tax.....		$41,215

NORMAL TAXES

Net inc. for 1918.	$123,000		
Deduct:			
Ex. prof. tax	41,215		
Specific exm.	2,000	43,215	
Amt. of inc. subject to normal tax	$79,785		
Normal tax at 12 pe rcent.....			9,574.20
Total tax			$50,789.20

We stated in our first article the tax is payable in four installments, the first of which is due March 15, 1919, the final date for filing returns.

QUESTION:—*Last year American citizens residing in Canada had to pay both Canadian and the United States income taxes according to the law of the two countries. The Canadian law did not tax Canadian citizens residing in the United States, but the United States law was not quite as just. I have understood right along that this double taxation would be taken care of in the 1918 law, and that a scheme would be worked out between the two governments which would remove the infliction of any such unjust taxation as we were up against last year. As a matter of fact it appears to the thousands of American citizens residing in Canada, that the old principle of taxation without representation should apply, and that even the 1917 law was unconstitutional so far as this particular part was concerned. However, most of us paid our taxes in order to avoid the possibility of trouble.*

There is a rumor here now that the new law does not remedy this injustice, but that we will still be subject to double taxation. Will your tax department be good enough to look into this and give me its opinion, and also state where a copy of the tax law can be secured. I am not certain of whether the law has been passed yet, but understand that these provisions are definitely known.

ANSWER: We presume from the above that you are an American citizen residing in Canada and that last year you were obliged to pay Canadian as well as United States taxes. We can find no provision in the pending act which would exempt you from taxation by the United States. At this writing we know of no final print of the proposed act. We would suggest that you write to your congressman, care of the House of Representatives, Washington, D. C., to place you on the list to receive a copy when printed.

Contractors May Now Tell Secrets of War Work

Washington, Feb. 10.—The war department has issued a circular to all contractors specifically authorizing them "to furnish the public information concerning war department contracts and orders received by them." This has the effect of revoking the secrecy provision which the war department had inserted in contract for war work. The provision prohibited contractors from revealing any information as to work they were doing for the government.

To Build Furnaces in India

Indian Iron & Steel Co. Contracts With American Engineers for $5,000,000 Plant—To Ask Bids for Material Soon

BIDS will be asked for within the next few days by Arthur G. McKee & Co., engineers, Cleveland, for much of the equipment and material for a blast furnace plant to be built near Calcutta, India, for the Indian Iron & Steel Co. G. H. Fairhurst, managing director of the company, recently closed a contract with the engineers for planning and directing the construction of the plant at an estimated cost of $5,000,000.

The bids invited will be for between 3000 and 4000 tons of plates, for the better grade of fire brick entering into the construction of two furnaces and for other material and building equipment. The material will be shipped to India for fabrication there, while a by-product coke plant and the power plant for the furnaces will be purchased in England. The bids will be for immediate delivery and it is hoped to have all the material equipment purchased in this country shipped out within six or seven months.

Back of the enterprise is said to be a plan to make this the nucleus of the largest iron and steel plant in India. A report that the $5,000,000 appropriated by the company for "a complete steel plant" is incorrect according to Mr. McKee, who said that this expenditure was for the initial furnaces. Eventually, the company has in prospect the building of two more furnaces and a steel plant, calling for a much larger expenditure.

The Indian Iron & Steel Co. is allied with Burn & Co., of Calcutta, in which much British and Indian capital is invested. Mr. Fairhurst was for eight years manager of the Bengal Iron & Steel Co., before he organized the new company. He is now in the United States, making final arrangements for the building of the furnaces before going to England.

The plant will be located at Asansol, province of Bengal, in the heart of a large coal field. The ore will be brought a distance of 120 miles, the company having purchased six square miles of the deposits, at what is said to be a ridiculously low figure, considering the fact that analyses have shown that the ore contains from 67 to 70 per cent iron. The company estimates that the ore can be delivered on board cars at its plant at 12 cents a ton. Further calculation has convinced the promoters of the enterprise that pig iron can be made for between $4 and $6 a ton and can be delivered in New York to sell at a lower figure than American-made product.

An important factor entering into the enterprise, from the construction of the plant to the making of iron, is the cheap labor in India. This was considered of such importance that some of the labor-saving devices which constitute part of the modern American blast furnace outfit, have been eliminated, because the labor cost is cheaper than the cost of such equipment. Certain labor-saving devices will be made a part of the equipment to enable the plant to operate at certain seasons of the year when climatic conditions make work uncertain. Day labor can be had in India at 10 cents.

The Indian Iron & Steel Co.'s furnaces will have a capacity of 400 tons each. The stove equipment will be larger than the average, but in other respects American design will be followed throughout.

Reversing Valve

(*Concluded From Page* 452)

stricted areas in the passage formed by the ports and hood, thus obtaining maximum efficiency from the stack draft. All leakage or waste of gas is prevented by the water-seal. The latter requires no packing, tightening or adjusting, but does require the flow of a small quantity of water into the bed plate in order to replace the amount evaporated.

Due to its compactness, the valve requires comparatively little floor space and adapts itself to various arrangements of flues from the regenerators to the stack. The weight of the hood is counterbalanced by the weights of the lever arm in such a way that the hood is in balance at any position. To move the hood it is only necessary to exert enough force to overcome friction.

The materials used for each part of the valve are selected to give long life. The hood and casing are lined with fire brick and all working joints are protected from the hot gas. Bearings and wearing parts are designed with a high factor of safety. There are chilled bearings in the bed plate for the rocker arms and hardened links and pins on the hood supporting arms.

The construction of the valve is such that all parts may be easily inspected and removed.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Business Views New Tax Bill as Handicap

CONSIDERABLE criticism is expressed in business circles relative to the revenue bill as completed by the senate and house conferees. While the new bill corrects some of the blunders that were seen in former drafts, it creates new difficulties and requirements. The body of the bill was devised when the country was at war and when the outlook for early peace was poor. It was aimed to curtail nonessential buying through taxation, to promote economy and in all respects to further war activities.

Now that the war is over the government is endeavoring to stimulate industry, to revive confidence. It is desired that consumers buy. Yet the new revenue bill is opposed to the new attitude of the government and the new needs of the public. It proposes to absorb necessary accumulations of business capital and to penalize the consumer who buys anything more than he absolutely needs. Taxation is a burden which all must bear, even though the bill fails to impose the income tax on the workingman and the farming class. Now of all times is the time for greater relative dependence on loans and the imposition of moderate taxation to liquidate the loans slowly.

The revised bill calls upon the taxpayers of the United States to pay about $6,000,000,000 into the federal treasury during the current fiscal year and $4,000,000,000 in the following years. About $4,627,000,000 of the revenue to be collected in 1919 will be raised by taxes on incomes and war excess profits.

How Individuals Are Assessed

The individual income taxation rate for the calendar year 1918 is fixed at 12 per cent of the amount of the income in excess of credits, but the first $4000 of income in excess of credits shall be 6 per cent. For each calendar year after 1918 the rates are fixed at 8 and 4 per cent respectively. The surtax which shall be applicable to all taxable income above $5000 begins with 1 per cent on the amount over $5000 and not more than $6000; 2 per cent on the amount over $6000 and not more than $8000; and then increases at the rate of 1 per cent each additional $2000 until it reaches 64 per cent on that portion of income between $500,000 and $1,000,000 and 65 per cent on all income in excess of $1,000,000.

The new bill is even more complicated as regards the excess profits taxes than is the present law. The bill gives much space to defining invested capital, in which respect it is something of an improvement over the present law. Invested capital is made to include actual cash paid in for stock, actual cash value of tangible property paid in for shares, but in no case shall exceed the original stock or shares issued therefor, unless the cash value is clearly and substantially in excess of the par value of the stock, in which case the excess shall be treated as paid-in surplus.

Intangible Property Included

Invested capital also includes paid-in or earned surplus and undivided profits, exclusive of those earned during the taxable year. Intangible property is included to an amount not exceeding the cash value of the property at the time paid in, the par value of the stock issued therefor or in the aggregate not more than 25 per cent of the par value of the total stock outstanding March 3, 1917, whichever is lowest. Patents and copyrights are included similarly. Invested capital does not include borrowed capital. Liberal relief provisions giving the collector large discretion are incorporated in the bill.

The working of the war excess profits provisions recently were explained by Senator Reed, who cited as an example a corporation having a capital of $1,800,000, a net income of $1,800,000 and three shareholders. According to the senator's compilation the three stockholders would retain $297,393.36, or slightly over 16 per cent, out of $1,800,000 of net income. The net result would be that the corporation would pay the 80 per cent war profits tax. This will be true of nine-tenths of the corporations; but it is necessary to go through with the computations to find whether the war profits tax exceeds the excess profits tax. If it does not, then the taxpayer pays on the excess profits instead of the war profits total.

The corporation net income tax out of 1918 revenues is placed at 12 per cent and for each calendar year thereafter, 10 per cent. This tax is levied on income after deduction of war profits taxes.

Sales by Trumbull Steel Aggregate $27,000,000

Sales during 1918 of the Trumbull Steel Co., Warren, O., were $1,000,000 in excess of the high level of $26,000,000 in 1917. These figures were incorporated in the statement of President Jonathan Warner made at the annual meeting, held recently. Net earnings on those sales were $3,126,453. The annual payroll was $7,000,000, or $3,000,000 more than was distributed in 1917.

The trial balance sheet shows current assets and government securities amounting to $11,023,279 while the plant assets are $15,930,366. During the last two years, the report shows, $6,000,000 has been spent upon improvements and extensions. Total assets including plant and quick assets, are $26,974,113.

During the year the company paid to stockholders $1,368,000 in dividends and $2,500,000 to the government in taxes. The surplus after all charges is $6,532,924.

The output for the year was 220,000 tons of finished material, the principal items of which are steel sheets and tin plate. The company's equipment now includes 19 tin mills, 13 sheet mills, two jobbing mills, one cold strip mill, one hot strip mill, seven open-hearth furnaces of 100 tons capacity each, one blooming mill and a Morgan 18-21-inch bar mill. Nothing was done during the year to place

the ore and coal lands which the company owns on a productive basis. These ore lands are located in the Lake Superior region and in Westmoreland county, Pa.

Officers elected were: President, Jonathan Warner; vice presidents, W. H. B. Ward, Philip Wick and A. N. Flora; secretary, William McFate; and treasurer, Lloyd Booth. The following directors were elected by the stockholders: Mr. Warner, Mr. Wick, Mr. Flora and John T. Harrington.

Midvale's Net Declines in Year and Quarter

For the three months ended Dec. 31, the report of the Midvale Steel & Ordnance Co., shows a decline in net profits, when compared with both the preceding quarter and the corresponding quarter in 1917. The net after charges and war taxes was $5,023,997, equivalent to $2.51 on the 2,000,000 shares of capital stock as compared with $7,793,627, or $3.89 a share in the September quarter and $10,882,037 or $5.44 a share in the same quarter the year before. Earnings for the period ended Dec. 31, 1918 compare with the preceding year as follows:

	—Fourth Quarter—	
	1918	1917
Net earnings	*$8,456,670	†$18,393,605
Federal tax reserve	.....	5,220,668
	1918	1917
Interest charges	869,824	817,086
Depreciation, etc.	2,562,849	1,473,794
Net profits	$5,023,997	$10,882,037

*After provision for all taxes. †Before war taxes.

Statement for the year ended Dec. 31, 1918, as compiled from the company's quarterly reports shows a net profit after charges and war taxes, of $29,163,408, equivalent to $14.58 a share earned on the stock of $50 par value, as compared with profits of $34,235,503 or $17.12 a share in 1917. Income account for the year ended Dec. 31, 1918, compares as follows:

	—Year—	
	1918	1917
Net earnings	*$41,931,068	†$71,264,560
Reserve for federal tax	.....	27,360,270
Bond interest	3,220,844	3,253,748
Depreciation, etc.	9,546,816	6,415,039
Net profits	$29,163,408	$34,235,503

*After all taxes. †Before war taxes.

Consolidated Steel Sales Charter at Washington

Washington, Feb. 11.—The Consolidated Steel Corp., which recently organized to handle the export trade of the independent steel producers of the country, has filed papers with the federal trade commission for authority to export under the Webb act. In the papers filed the company has computed its common stock at $100,000,000, with a par value of $100. "Exporting steel, iron and products thereof," has been given in the application as the business in which the firm is engaged.

This organization is made up of 10 of the largest independent steel producing companies of the country. They are the Bethlehem Steel Co., the Brier Hill Steel Co., the Lackawanna Steel Co., the Lukens Steel Co., the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co., the Sharon Steel Hoop Co., the Trumbull Steel Co., the Whittaker-Glessner Co. and the Youngstown Sheet & Tube Co. These companies control more than one-quarter of the steel making capacity of the United States, and their organization means a strong exporting body.

The company's offices are located in the City Investment building, 165 Broadway, New York. E. A. S. Clarke, former head of the Lackawanna Steel Co., and H. H. Barbour, formerly with the same concern, are now acting as president and vice president respectively of the export company. Other officers chosen are L. W. Hesselman, secretary and controller; A. Van Winkle, treasurer; and William Heyman, traffic manager.

Krupp's Profits Slump

How the closing months of the war affected the business of the F. Krupp Co., Essen, Germany, is shown in the 1918 balance sheet just issued. Net profits were reduced in excess of $9,000,000 from what they were in 1917. In the 12 months ended Dec. 31, 1918, the net profits were $1,235,000 as against $10,240,000 in 1917. Gross profits were $11,300,000, as compared with $24,900,000 in the previous year. No dividends were declared and the report states that it was considered advisable to write off $10,000,000 for contingent war losses. Stocks, consisting chiefly of unfinished war material, are valued at $187,500,000. Stocks in the 1914 balance sheet were valued at $39,000,000. The present capital of the concern is $62,500,000, and is held almost exclusively by members of the Krupp family. It was increased from $45,000,000 to the present amount at the end of 1914.

At a meeting of foremen and apprentices of the firm, just held in Essen, it was stated that they had been informed by the management that under peace conditions it would probably be impossible to employ more than 10,000 to 12,000 workpeople, as against about 40,000 before the war, and very considerably more during it. Regular production of any kind would be quite out of the question for a long time to come, and as the occupation of Essen by allied troops was considered by no means unlikely, it was impossible to make any forecast as to the future course of the undertaking.

Better Demand

Follows Reduction of Naphthalin Prices—Buy Benzol Motor Fuel

New York, Feb. 8.—A marked improvement in demand has followed the reduction in the price of naphthalin which was reported a week ago. Considerable business is being entered for the 1919 season at 8½ to 9½ cents per pound for flakes, and at 10½ to 11½ cents for balls. A slight increase in activity has characterized sulphate of ammonia during the week. This resulted mainly from the booking of a number of small export orders. The market on sulphate of ammonia is unchanged at $4.45 to $4.55 per 100 pounds at producers' plants.

A heavy demand for benzol for use as motor fuel continues to come from garages. The buying by the automobile business has resulted in taking up the output of benzol to a much larger extent than has been the case for some time. Toluol continues to be quoted at 25 to 35 cents per gallon at producers' plants, the price depending upon the quality. The phenol market is entirely nominal due to the lack of demand, but the price probably is something below 15 cents. Demand for solvent naphtha continues good. This product is quoted as before at 20 to 25 cents per gallon at producers' plants.

Coke Oven By-Products

	Spot
Per Gallon at Producers Plant	
Pure benzol	$0.20 to .25
Toluol	.25 to .35
Solvent naphtha	0.20 to .25
Per Pound at Producers Plants	
Phenol	No market
Naphthalin, flake	$0.08½ to .09½
Naphthalin, balls	.10½ to .11½
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$4.45 to 4.55
Contract	
Pure benzol	$0.20 to .25
Toluol	.25 to .35
Solvent naphtha	.20 to .25
Per Pound at Producers Plant	
Phenol	No market
Naphthalin, flake	$0.08½ to .09½
Naphthalin, balls	.10½ to .11½
Per 100 Pounds Producers' Plants	
Sulphate of ammonia	nominal

Machine Tool Inquiry Rate Improves

Several Large Lists Out in New York—One Calls for 70 Machines for Shipment to Roumania—Small Inquiries Plentiful in Cleveland—Government-Owned Equipment is Seen Offered for Sale in Many Directions

IMPROVEMENT in the machine tool market is noted in all districts. This consists mainly of inquiries, although small orders continue to be placed. This betterment is most marked in the east, where several large lists are out. The Standard Oil Co., New York City, is asking for about 70 machines, mostly lathes for shipment to Roumania, and about 25 special machines for Bayway, N. J. A list of punching and shearing equipment is expected from this company as well as from the Bartlett-Hayward Co., Baltimore, which contemplates the erection of a ship repair plant. About 15 small machines are asked for by the Groton Iron Works, Groton, Conn. An inquiry is current in New York for a number of machines for a French shipyard. Milliken Bros. Mfg. Co., is expected to close shortly on a number of tools for a fabricating shop in New York City.

Buying in the machine tool trade is not as plentiful as could be wished, although in Chicago, it is better than had been expected. Sales are of single tools for the most part, no list exceeding two or three machines being booked. In Pittsburgh, machines to replace worn out equipment continue to be ordered. The action of builders in guaranteeing prices is not bringing out as many orders as was expected.

Equipment from war work plants is being offered for sale in many directions. Much of this is government-owned and the agreement made between builders and government officials is being set aside in several instances. The machines which have been operated in the plant of the Cribben & Sexton Co., Chicago, were offered for open sale. Protests were filed and this now is to be handled through the builders in harmony with the government's agreement. Bids are being asked of Chicago dealers on machinery, produced for the Amalgamated Machinery Corp., the Chicago-Symington Corp. and the American Steel Spring Co., for war work. It is believed that these bids are asked for the purpose of effecting a settlement with the government. Several hundred tools from a war work plant are being offered in Dayton and some smaller lists appear in Cleveland.

A list of government-owned cranes has reached Pittsburgh dealers. It was accompanied by a request that all inquiries for cranes of sizes on the list, should be referred to the salvage board at Washington. This request is meeting with some opposition.

Railroad requirements seem to be held up indefinitely. Cleveland dealers express the belief that the railroads soon will return to private ownership and when they do large lists are anticipated. One of the largest projects in abeyance along this line is the locomotive repair shop of the Pennsylvania railroad at Marietta, Pa.

One bright spot in an otherwise dull crane market is the recent reinstatement of the crane orders for the Newport News Ship Building & Drydock Co., Newport News, Va. This project was abandoned when the armistice was signed but it was since revived. New inquiry for cranes is small.

Standard Oil Wants 70 Machines for Roumania

SEVERAL sizable inquiries have appeared in the east to add a somewhat improved tone to the machine tool market. The Standard Oil Co., 26 Broadway, New York City, has issued quite an extensive list of machine tools for shipment to Roumania, and is also inquiring for equipment for this country. The equipment for shipment abroad is said to include more than 70 machines, the majority of which are engine lathes, while the list for this country includes approximately 25 special machines for Bayway, N. J. The company is also expected to come into the market shortly for considerable punching and shearing equipment. Another large list before the trade at this time is that of the Bartlett-Hayward Co., Baltimore, which is understood to be contemplating the erection of a ship repair plant. This list includes considerable punching and shearing equipment. The Groton Iron Works, Groton, Conn., is in the market for about 15 small machines, including grinders, drills and lathes. A small list of machine tools is also being issued at this time by the Luders Marine Construction Co., Stamford, Conn. The navy department continues in the market for machine tools and has recently purchased six turret lathes for its yard at Washington. Bids are expected to be closed shortly by the Milliken Bros. Mfg. Co., on a dozen or more machines for a fabricating shop at 136th street and Locust avenue, New York City. Russell B. Smith, 50 East Fortieth street, New York, is inquiring for a number of machines for a shipyard in France.

While there is some improvement in inquiry in the East, the volume of buying remains small. Buyers are still hesitant over prices, and consequently are inclined to shop around, and possibly postpone buying altogether at this time. Two additional factors in the inactivity of the present market is the delay at Washington in the settlement of contracts, particularly the informal con-

ROLLING MILL JIM IN PEACE

Say Fellows:

I have been going like H— for so long now I am glad there is a little let up, it will give me a chance to have my working parts gone over and find out whether workin' at high speed does any real harm after all.

I know it doesn't hurt those Hubbard Rolls, you can't put them in the hospital, but I am not built as strong as they are.

So Long,

Rolling Mill Jim.—

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.

tracts which are still under discussion in congress, and the slow progress being made in the disposition of government-owned equipment. Until the haze of the present unsettlement is lifted, buyers are very likely to continue to move slowly. The methods employed by the government in disposing of its equipment so far have in some instances proved highly disturbing to the trade. Bids are reported to have been asked in several cases, and one, that of the Cribben & Sexton Co., Chicago, has attracted widespread interest. Bids were asked by the government on its equipment at the Chicago plant until the middle of this month. However, in this case pressure has been brought to bear which will result in the equipment being handled by the machine tool builders under the agreement recently reached instead of it being placed upon the open market as originally proposed.

With the requirements of the railroads apparently held up indefinitely, the eastern crane market assumes an exceedingly dull aspect. Perhaps the largest railroad project to be placed in abeyance is the locomotive repair shop of the Pennsylvania railroad at Marietta, Pa., for which a number of cranes were asked. One bright spot, however, in the crane market at this time is the reinstatement of orders by the Newport News Shipbuilding & Drydock Co., Newport News, Va., for cranes for a marine boiler plant at Richmond, Va. This project was abandoned when the armistice was signed, but has since been revived. A new inquiry to come before the market calls for a small crane, with 40-foot span, for the Sparrows Point, Md., plant of the Bethlehem Shipbuilding Corp.

Small Lots Selling in Chicago

SELLING of machine tool equipment by Chicago dealers continues at a better rate than had been expected during the period of readjustment. The business is made up almost entirely of single tools and small lots, scarcely a list of more than two or three tools being encountered. January was an unusually good month, the total in most instances surprising dealers when it was made up, as the lack of high spots had made the month seem fairly dull. Backwardness of railroads in buying additional equipment is keeping the market much below what it might be.

Dealers have been asked to make bids on machinery manufactured for war production, which now is useless and will be sold. This includes equipment for the Amalgamated Machinery Corp., the Chicago-Symington Corp. and the American Steel Spring Co. It is believed these bids will not result in placing the machinery with dealers, but will be used as a basis in claims against the government on account of contract cancellations. The general belief is that 90 days hence business will be brisk and demand for machinery as large as can be handled.

Sealed bids will be received at the office of the general purchasing agent Alaskan Engineering commission, Bell street dock, Seattle, up to 11 a. m., March 3, for furnishing free of all charges, engine lathe, machine shop planer, drilling machines, steam hammer, lathe chucks, drill press, index centers, oil fuel babbitt furnace, reversible ratchet, sockets, locomotive boring bar and journal jacks.

Replacement Orders Appear in Pittsburgh

IN the Pittsburgh district, the equipment and machine tool trade still is for the most part, marking time. There is some replacement of equipment that has become worn out, but this measures the extent of the demand, which as has been the case for several weeks past, is as often met from used as from new offerings. Few large tools are sought, the demand running largely to the lines that are carried in stock, or on which prompt delivery can be made. Requests for prices on cranes and other heavy equipment still are coming out, but as yet few projects that will call for large lines of machines and tools have gone further than the estimating departments of the construction companies. No general revision of prices has taken place, but a number of builders have announced a willingness to guarantee buyers against a decline for periods running from three months to a year. These

German Machinery Dealers in Mexico Object to Embargo

AS a result of the rigid enforcement of the "trading with the enemy" embargo against German machinery and implement dealers in Mexico, the latter are unable to replenish their depleted stocks. For more than 30 years the machinery and hardware business of Mexico has been in almost complete control of the Germans. In the prewar days they bought their mining machinery, industrial equipment of various kinds, farm machinery and implements and small hardware exclusively in Germany. In recent years American interests have established a few houses of considerable size chiefly for the handling of mining machinery, and in Tampico as well as the gulf coast oil fields, the Germans were forced out of business by the energetic competition of the former several years ago.

Now the German machinery and implement men of Mexico raise a complaint against the trade embargo that is being applied against them. Unhesitatingly they say that financial failure soon will be theirs unless they are permitted to buy their goods in the United States. The situation is so acute that at a recent meeting of the principal dealers held in the city of Mexico a committee was appointed to wait upon Henry P. Fletcher, United States ambassador, and make an appeal to him that he exercise his good offices in getting the embargo lifted so far as their respective cases were concerned. This committee stated that German dealers' warehouses and stores are nearly empty; that they have no way of obtaining goods with which to restock their establishments except by purchasing them in the United States; and that they are ready at this time to place orders for machinery and farm implements to a value in excess of $3,000,000 gold if the embargo is raised. Most of the goods wanted, they asserted, would not come into competition with those of American dealers in this country. Ambassador Fletcher gave the German dealers no assurance that there would be any immediate change in the restrictions against enemy traders but it is understood that he will discuss the situation with the government authorities at Washington during his present visit.

An unusually large demand for tractors and motor trucks is noted in Mexico at this time. In times past the German dealers handled tractors but all purchases of this nature during the war period have been made through American concerns. The automobile and motor truck business of this country is chiefly in the hands of Americans although many native Mexicans are becoming interested in these lines of trade.

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Cleanliness is second only in importance to **Quality** in Farrell-Cheek Steel Castings.

Here is a busy section of our Cleaning Dept. These men are engaged in grinding the smaller classes of castings, an operation that is as carefully supervised and checked up as are moulds and metal.

Note the individual overhead motors driving the stand grinders, also the ample daylighting and ventilation and the general cleanliness of this modern plant.

It all contributes to Farrell-Cheek superiority.

Immediate Delivery

Farrell-Cheek Steel Foundry Co.

Makers of Steel Castings that are a little better than the next best.

Sandusky, Ohio

Say you saw it in THE IRON TRADE REVIEW

inducements are not resulting in the placing of orders at the rate anticipated.

A list of government-owned cranes recently has reached some of the Pittsburgh trade. With this list a request was received that dealers who receive any inquiries for cranes of the sizes and types listed submit the inquiry to the salvage board in Washington before bidding on the business. It is stated that the list contains no cranes of more than 25 tons. Some difference of opinion exists here as to whether the request of the salvage board should be complied with, as most builders need business now, or will within the next few months. Some crane builders are disposing of government-owned cranes which never left their shops, on a commission.

Splendid Rate of Inquiry Maintained

ACTIVITY in the Cleveland machine tool market consists chiefly of answering inquiries. Each mail brings its quota of requests for prices. Buying is held in abeyance, however, purchasers apparently being cognizant of the fact that many plants have government-owned equipment on hand which they cannot use now that the war is over. Naturally the buyers expect that sooner or later it will appear on the market and they will be able to supply their needs at prices much lower than they now obtain in response to their inquiries. Hence, they prefer to wait and do so except in those cases where machinery must be had immediately. The disposition of the government-owned equipment continues to exercise a disturbing influence upon the market. Several cases are cited where the agreement reached several weeks ago by and between tool builders and government officials is not being adhered to.

Plant conversion from a war to a peacetime basis, is sending many tools into the market, several fair-sized lists appear in Cleveland and several hundred tools, valued at more than $1,000,000, it is said, has been listed for sale with a dealer by the Dayton Metal Products Co. Dayton. Recently the Spencer Mfg. Co., Toledo, which made 75 centimeter shells during the war, sold its equipment consisting of 116 lathes and 36 drill presses to the L. Gerson & Son's Co., East Broadway and the Wheeling & Lake Erie railroad, that city. The latter concern is to dismantle the building and sell the machinery. The Machine Products Co., Cleveland, is in the market for equipment. It is converting its plant to produce gears instead of shells.

One factor which continues to hold up much buying of machine tool equipment, is the delay in settling informal war contracts by the government. Dealers are optimistic that busy days of trading are ahead when these settlements finally are made. Some agree with Secretary of the Interior Lane, who places the date of a return to normal business, six months ahead. Others say that the government should speed things up a trifle.

Automobile accessory manufacturers are buying a small amount of equipment. Cleveland dealers anticipate with interest the coming automobile show in that city. They expect many out of town buyers to take advantage of the opportunity to fill their requirements of machine tools at that time. Henry Avery, Ashland, O., is enlarging his accessory plant. The J. W. Murray Mfg. Co., Detroit, announces that it will install needed equipment in two additions, authorized at a meeting of its board of directors in January. The Diebolt Safe & Lock Co., Canton, O., desires a sheet straightener, with capacity up to 50 inches wide and one-eighth inch thick. The Grain Belt Tractor Co., Fargo, N. D., is asking for a lathe and a gear grinder. The Galion Metallic Vault Co., Galion, O., has recently doubled its capitalization to $500,000 to enlarge its business. It will require some heavy shears, rolls and brake, all with electric motors.

Several Inquiries Out in Canada

INTEREST in machine tools and equipment has revived in Canada and several inquiries are out. E. A. Lowry, Herald building, Guelph, Ont., is in the market for a vertical boring mill. The National Shipbuilding Co., Goderich, Ont., is looking for a radial drill for its boiler shop and also wants a lathe. The Canada Wire & Cable Co., Ltd., Leaside, Ont., is installing machinery for the manufacture of steel wire rope. The Sheet Metal Products, Ltd., 199 River street, Toronto, has issued a list which includes engine lathes, wet grinders, shapers, slotting machines, vertical millers and stamping presses. William Kennedy & Sons, Ltd., Owen Sound, Ont., recently completed an addition to their iron and steel plant and are in the market for equipment. They also want a 15-ton electric traveling crane with a span of 39 feet and 10 inches, 60-cycle, 3-phase, 550-volt capacity.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

MONTPELIER, VT.—A new company is being organized by the board of trade, to build a $300,000 plant for the manufacture of steel balls.

BOSTON.—The Boston Drydock & Shipbuilding Co., Thomas S. Baker, 721 Hotel Touraine, is taking bids for the erection of a ship repair plant, estimated to cost $2,000,000.

NORWOOD, MASS.—John A. Whittemore & Sons is having plans drawn for the erection of a coal pocket and office building.

WAKEFIELD, MASS.—Curley Bros. plan the erection of a coal pocket and the installation of machinery.

WORCESTER, MASS.—The Boston Pressed Metal Co. recently purchased land on which it plans to erect a plant.

PROVIDENCE, R. I.—The Providence Body Co., 536 Atwells street, plans the erection of a plant, construction to go ahead in the spring.

PROVIDENCE, R. I.—The Ware Products Co. has been incorporated to manufacture mechanical appliances with $60,000 capital, by Charles H. Kenyon, R. W. Farmer, Hartford, Conn.; Edmund R. Ware and Lyman H. Kilton, Worcester, Mass.

BRANFORD, CONN.—The Malleable Iron Fittings Co., V. T. Hammer in charge, is erecting a steel foundry, 20 x 135 feet, at a cost of $50,000.

BRIDGEPORT, CONN.—The Bridgeport Metallic Works, Inc., has been incorporated with $150,000 capital, by W. V. Thompson, G. C. Williams and M. L. Conrad.

HARTFORD, CONN.—The Uno Screen Co. has been incorporated with $1000 capital, by William H.

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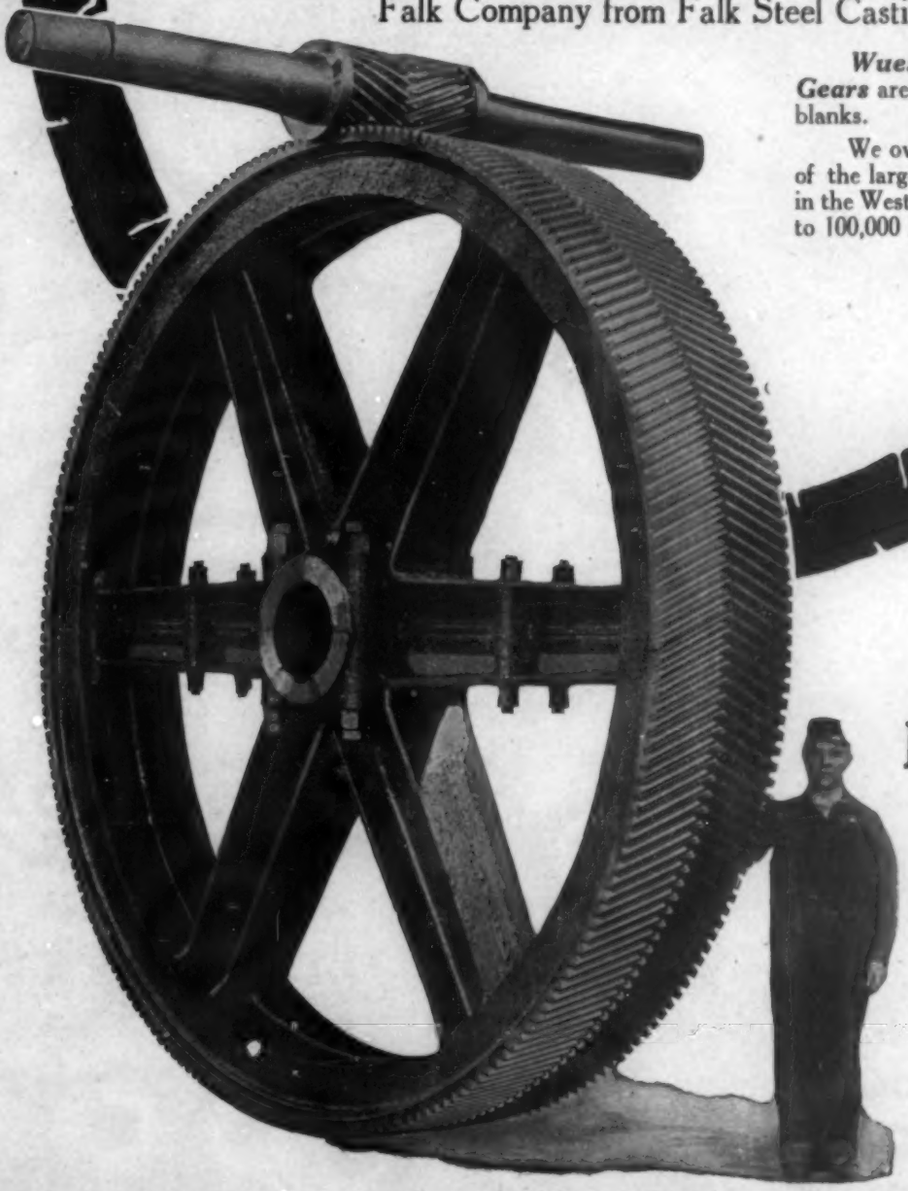
If you are interested in obtaining
—maximum mechanical efficiency
—elimination of shock and vibration
—minimum noise
—absolute reliability
specify ***Wuest Herringbone Gears,*** manufactured by the Falk Company from Falk Steel Castings.



Wuest Herringbone Gears are hobbed from solid blanks.

We own and operate one of the largest Steel Foundries in the West, capacity 1 lb. to 100,000 lbs.

The Falk Company
Milwaukee, Wis.

Agents:
Pittsburgh—W. O. Beyer, 1024 Park Bldg.
New York—M. P. Fillingham, 50 Church St.
Wilkes-Barre—Vulcan Iron Works
Denver—Denver Engineering Works
San Francisco—F. W. Grimwood, Rialto Bldg.

Say you saw it in THE IRON TRADE REVIEW

Curry, New York, F. C. Rockwell and George L. McLean.

BRIDGEPORT, CONN.—The Remington Arms Union Metallic Cartridge Co., will equip a 1-story boiler and mixing house, 36 x 54 feet.

NEW BRITAIN, CONN.—Contracts have been awarded by the North & Judd Mfg. Co., manufacturer of hardware, for a $16,000 plant addition.

NEW HAVEN, CONN.—The New England Iron Works contemplates the erection of a 1-story, 60 x 200-foot plant at Cedar Hill.

NORWICH, CONN.—The B. B. Storage Battery & Welding Co. has been incorporated with $2500 capital, by H. P. Benjamin, H. F. Bamber and S. A. Benjamin.

WATERBURY, CONN.—The Thin Sheet Metal Co., 11 Lodlow street, plans to erect a plant, 48 x 80 feet, to cost about $65,000.

Along the Atlantic Coast

BROOKLYN, N. Y.—The Norman Foundry Co. has been incorporated with $15,000 capital, by J. and H. Miller and B. Zwerin, 856 Griggs avenue.

BROOKLYN, N. Y.—A plant is being erected for the Jay-Johnson Street Corp., and when completed will be leased by the Ever-Ready Safety Razor Corp.

BUFFALO.—The Carbon Metal Products Co. has been organized with a capital of $12,000 and will fit up a plant soon.

DUNKIRK, N. Y.—The Atlas Crucible Steel Co. plans the erection of two plant additions.

ENDICOTT, N. Y.—The International Time Recording Co. recently awarded a contract for the erection of a boiler house extension, estimated to cost $4000.

FULTON, N. Y.—The John Hunter Corp., manufacturer of a gasoline saver, recently was incorporated with $200,000 capital, by J. Hunter, J. C. Hunter and F. C. Hunter.

JAMESTOWN, N. Y.—The Automatic Registering Machine Co., 163 Jones street, is building two additions to its plant.

NEW ROCHELLE, N. Y.—The New Rochelle Machine & Repair Co. recently was incorporated with $5000 capital, by M. A. Loftus, C. S. Schaffer and M. Smith, 233 Broadway.

NEW YORK.—Plans are being completed for $50,000 repair shop for J. H. Werbelovsky & Son, 83 Meserole street.

NEW YORK.—The Gordon Radiator Co. has been incorporated with $25,000 capital, by A. P. Anderson, H. B. Gordon and J. Bramwell, 34 Nassau street.

NEW YORK.—The Generator Valve Co., 47 Dinsmore place, has had plans prepared for the erection of a foundry, 35 x 60 feet.

NEW YORK.—J. Manton, 44 Court street, machinist, has awarded a contract for the erection of a plant.

NEW YORK.—The Standard Cinema Machinery Mfg. Corp. has been incorporated with $100,000 capital, by T. Rosenwasser, B. H. Freedman, 340 West Eighty-sixth street, and others.

NEW YORK.—The American Wire Rope Syndicate, Inc., has been incorporated with $25,000 capital, by A. Brunn, A. Brodigan and P. Paulsen, 109 Broad street.

NEW YORK.—The Wern Rotator Co., riggings and hoisting machinery, has been incorporated with $50,000 capital, by G. P. Wern, and W. C. Wern, 96 Hamilton place, New York, and H. C. Brot, 92 Oxford avenue, Richmond Hill.

NIAGARA FALLS, N. Y.—The Union Carbide Co., Union street, plans the erection of an electric switching station, estimated to cost $45,000.

POUGHKEEPSIE, N. Y.—The Poughkeepsie Cutlery Works plans the erection of a plant addition.

POUGHKEEPSIE, N. Y.—The Knickerbocker Motors, Inc., 170 Broadway, New York, is having plans drawn for the erection of a plant estimated to cost $40,000.

POUGHKEEPSIE, N. Y.—The Liberty Starters Corp., 200 Fifth avenue, New York, recently awarded a contract for the erection of a plant, 60 x 205 feet, estimated to cost $50,000.

JOHNSTOWN, PA.—The core department of the National Radiator Co. recently was damaged by fire. The loss exceeds $15,000.

McKEES ROCKS, PA.—The Enterprise Stamping Co. is having plans drawn for the erection of an addition to its plant.

McKEES ROCKS, PA.—The Taylor-Wilson Mfg. Co. recently awarded a contract for the erection of a foundry, 90 x 190 feet, to replace one recently damaged by fire.

MEADVILLE, PA.—Part of the plant of the Meadville Wrench Co. recently was badly damaged by fire. The loss has not been determined.

MORGANTOWN, PA.—The Chaplin-Koener-Kerr Co., Farmers' and Merchants' Bank building, is planning the erection of a plant for the manufacture of metal products.

PHILADELPHIA.—C. E. Biddle has received a permit for the erection of a small addition to his machine shop.

PHILADELPHIA.—Work has been started by the Philadelphia Steel & Iron Co. on a forge shop addition, 60 x 120 feet.

PHILADELPHIA.—Work will go ahead shortly on a 5-story, 50 x 108-foot addition to the plant of the William Sellers & Co., Inc., manufacturer of machine tools.

PITTSBURGH.—The Carbon Steel Co. will build a one-story boiler plant, 40 x 170 feet.

PITTSBURGH.—Lee C. Moore & Co., Oliver building, will build a plant at Tulsa, Okla., to manufacture steel pipe derricks.

PITTSBURGH.—The R. Gracey & Sons Co., First avenue, manufacturer of forgings, has purchased additional property.

PITTSBURGH.—The Gerstner Boiler Works, capital $100,000, has been incorporated by F. P. Gerstner and Elizabeth F. Gerstner, Glenshaw, and D. L. Seskey, Pittsburgh.

PITTSBURGH.—The Gas Engine Construction Co., capital $5000, has been incorporated by W. G. Cummins, Pittsburgh, W. B. Way, Coraopolis, and Arthur Booth, Aspinwall.

POTTSVILLE, PA.—The plant of the Pottsville Foundry recently was damaged by fire.

VILLA NOVA, PA.—The Philadelphia & Western railway is erecting two electric substations, estimated to cost about $20,000.

WOMELSDORF, PA.—The Larine Refractories Co., which has 130 acres of silica sand here, has let the contract for a new plant.

CAMDEN, N. J.—The Philadelphia Metal Church Goods Co., 509 Federal street, has been incorporated with $50,000 capital.

EAST ORANGE, N. J.—The Roller Bearings Mfg. Co., recently organized, has acquired a site for a plant.

HOBOKEN, N. J.—W. & A. Fletcher Co. will erect a floating dry dock between Fourteenth and Hudson streets to cost $1,500,000.

KEARNY, N. J.—A boiler shop and other buildings at the plant of Swift & Co., recently badly damaged by fire, will be rebuilt.

NEWARK, N. J.—M. R. Everett, plans alterations to his iron works on Avenue D.

NEWARK, N. J.—The Beaver Machine & Tool Co. has been incorporated with $250,000 capital, by E. B. Slade, Anton Felin and Hugo Burgman.

NEWARK, N. J.—The French Mfg. Co., 135 Jackson street, has leased property from the Universal Castor & Foundry Co., for the manufacture of metal products.

NEWARK, N. J.—Wallmax Mfg. Co., 523 Springfield avenue, has been incorporated with $125,000 to manufacture electrical and mechanical equipment. Oswald Jentsch, 110 Whittlesey avenue, West Orange, is an incorporator.

PERTH AMBOY, N. J.—The Perth Amboy Drydock Co., Broad street, plans the erection of a shop and ship repair plant.

UNION, N. J.—The Hind Steel & Wire Works contemplates rebuilding its fabricating plant.

DOVER, DEL.—The Marine Equipment Corp., mechanical and electrical devices, has been incorporated with $50,000 capital, by F. R. Hansell, E. M. Macfarland and J. Vernon Pimm, of Philadelphia.

BALTIMORE.—The Bethlehem Steel Co. will take bids soon for the erection of a pumping station, 50 x 75 feet, to be located at Sparrows Point. The cost is estimated at about $25,000.

ALTAVISTA, VA.—The Steel Castings Corp. recently was incorporated with $50,000 capital, by P. F. Henderson and others.

NORFOLK, VA.—The Virginia Iron Works is erecting a machine shop, 1 and 2-story, estimated to cost $50,000.

NORFOLK, VA.—A $7,500,000 ship repair plant will be erected here by the Norfolk-Hampton Road Ship Repair Corp.

NORFOLK, VA.—The Manganese Steel Castings Co. will start work shortly on the construction of a 2-story, 30 x 60-foot plant.

NORFOLK, VA.—The Hampton Roads Drydock & Ship Repair Corp., Bank of Commerce building, plans the erection of a shipbuilding plant.

Central States Activities

CHILTON, WIS.—About 3000 lineal feet of 4 and 6-inch cast iron water mains will be laid in Chilton during 1919.

EAU CLAIRE, WIS.—The United States Auto Gear Shift Co. plans the erection of an addition to its plant.

JANESVILLE, WIS.—The Townsend Mfg. Co., which recently raised its capital from $125,000 to $175,000, will invest about $35,000 in extensions.

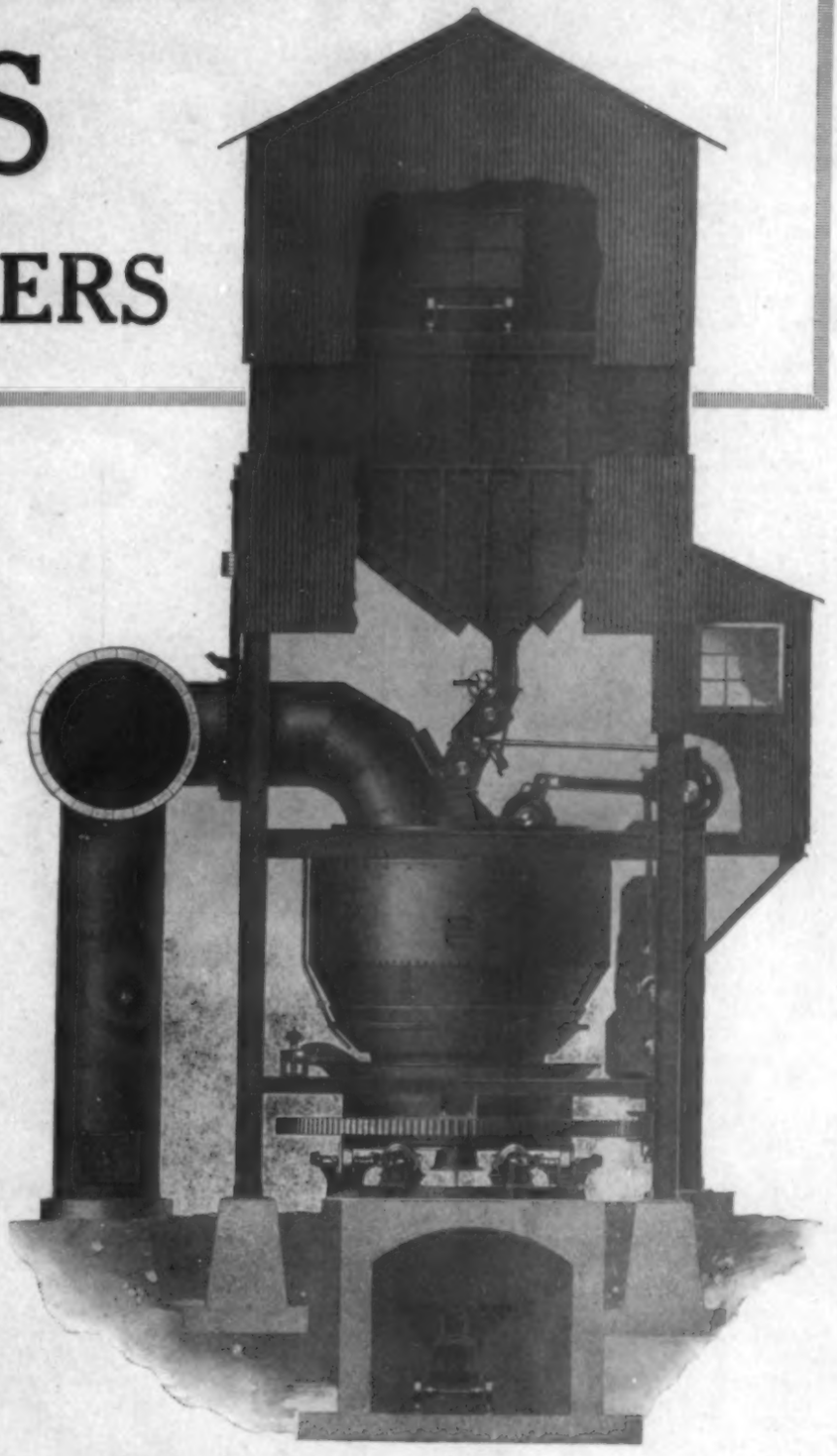
LACROSSE, WIS.—The Nash Auto & Machine Co. has been organized by Howard Atkinson and Erwin Mueller and will open a garage and commercial machine shop.

MADISON, WIS.—The Madison-Kipp Co., manufacturer of lubricating devices, has acquired a site on which it plans to erect a new plant.

MANITOWOC, WIS.—The Manitowac Plating Works, 1022 South Tenth street, is having plans prepared for the erection of a 1-story, 50 x 100-foot plant.

MARSHFIELD, WIS.—The board of education will

HUGHES MECHANICAL GAS PRODUCERS



THE Wellman-Seaver-Morgan Company is prepared to install complete producer gas plants—including buildings, producers, coal and ash-handling equipment, gas flues and valves, or it will supply the gas producer alone.

The W-S-M organization with many years' experience in this line has incorporated in the Hughes Gas Producers correct mechanical principles and excellent materials—resulting in a producer that assures uniformity of performance, low maintenance cost and a minimum labor charge.

A new bulletin giving a detailed description of this producer has just been issued. Shall we mail you a copy?

THE WELLMAN-SEAVER-MORGAN CO.

CLEVELAND, OHIO, U. S. A.

Say you saw it in THE IRON TRADE REVIEW

build vocational training and high school, which fully equipped will cost about $75,000.

MENASHA, WIS.—The Graef Wire & Mfg. Co. recently let a contract for the erection of a plant estimated to cost $50,000.

MILWAUKEE.—The Ewert Steel Aero Propelle Co. is being organized by Otto F. Ewert, 1227 Twenty-seventh street.

MILWAUKEE.—The new tractor plant which the Allis-Chalmers Mfg. Co. is building at West Allis, will be 110 x 320 feet. The company has under consideration tentative plans for early extensions.

PORTAGE, WIS.—The Portage Iron Works plans the erection of a foundry, machine shop and a garage.

FORT ATKINSON, WIS.—The James Mfg. Co., farm equipment, stanchions, etc., will equip a branch assembling plant.

WASHBURN, WIS.—The Anchor Co. plans the erection of a shipbuilding plant, to include a machine shop, 120 x 200 feet, blacksmith shop and punch shop, 160 x 300 feet, and a forge and foundry, 55 x 270 feet.

DETROIT.—The Charles Bohn Foundry Co., 738 Hart avenue, is having plans drawn for the erection of a foundry, 168 x 240 feet.

DETROIT.—The Peter Smith Heater Co., 1735 Mt. Elliot avenue, contemplates the erection of a plant addition.

DETROIT.—The Detroit Heat Treating Co., 1168 Cass avenue, is taking bids for the erection of a plant, one story, 45 x 60 feet.

FLINT, MICH.—The Champion Ignition Co., Harriet and Industrial avenues, plans the erection of a plant.

FLINT, MICH.—The Dort Motor Car Co. contemplates the erection of an automobile manufacturing plant.

GRAND RAPIDS, MICH.—The Grand Rapids Brass Co. contemplates the erection of a new plant, according to a report.

KALAMAZOO, MICH.—The Railway Supply Co. recently let a contract for the erection of an addition to its plant estimated to cost $10,000.

MONROE, MICH.—The Brisk Blast Co. recently purchased the plant formerly occupied by the Swiss Magnet Co. and plans the erection of a new foundry.

SAGINAW, MICH.—The Central Foundry Co. plans the erection of a large new foundry.

SAGINAW, MICH.—Mitts & Merrill, 1009 South Water street, is drawing plans for the erection of a machine shop.

ST. JOSEPH, MICH.—The Auto Specialties Mfg. Co. recently let a contract for the erection of plant extensions, including a foundry, 100 x 176 feet, and an annealing room. The outlay is estimated at $75,000.

CHICAGO.—The W. Horn Structural Iron Works, 336 North Leavitt street, is building a 1-story, 60 x 125-foot addition, estimated to cost $20,000.

CHICAGO.—Charles H. Besly & Co., manufacturer of grinders and grinding machines, contemplates the erection of an additiin to its plant at Beloit, Wis.

CHICAGO.—The Krasberg Mfg. Co., 536 Lake Shore drive, manufacturer of tools and dies, has bought 100 x 192 feet upon which it will build a plant.

CHICAGO.—The Precision Metal Works, care Architects Davidson & Weiss, 53 West Jackson boulevard, recently awarded a contract for the erection of a plant, 117 x 153 feet, estimated to cost $85,000.

DECATUR, ILL.—The Decatur Malleable Iron Works has plans to double the capacity of its plant this year.

FREEPORT, ILL.—The Stove Mfg. Co., W. A. Hanna, president, will build additions.

HOOPESTON, ILL.—The Sprague Canning Machinery Co. has broken ground for a new testing room, 40 x 60 feet.

JOLIET, ILL.—The Commonwealth Motors Co., 326 West Madison street, plans the erection of a plant addition.

JOLIET, ILL.—The Joliet Forge Co. will take bids about May 1 for the erection of a plant, 60 x 320 feet, estimated to cost $140,000.

LAWRENCEVILLE, ILL.—The Indiana Refining Co. contemplates the erection of car shops at a cost of $40,000.

WOODSTOCK, ILL.—The Woodstock Typewriter Co. recently awarded a contract for the erection of a plant, 63 x 76 feet, estimated to cost $20,000.

ANDERSON, IND.—The Indiana public service commission has granted the city a petition to issue bonds of $90,000, the proceeds to be used in improvements to the city light and water plant.

COLUMBUS, IND.—The Cummins Engine Co. has been incorporated with $50,000 capital, by C. L. Cummins, J. R. Dunlap, John E. Northway and Frank N. Richman.

Government Inquiries

BIDS on the following equipment are desired by the navy department, bureau of supplies and accounts:

One upright drill, 3710. South Boston.
One emery grinder, one variety saw, 3719 Hampton Roads, Va.
One commutator grinder, 3664, Puget Sound.
Miscellaneous jointers and planers, 3682, various yards.
One each engine lathe, pipe machine, bolt-threading machine, twist hack saw, drill grinder, double arbor-grinder, one crank shaper, 3710, South Boston.
One wood lathe, 3726, Norfolk.
One duplex coating machine, 3717, Mare Island.
Three polishing machines, three grinding machines, 3728, Puget Sound.
One charging machine, 3724, South Charleston.
One punching machine, 3732, Charleston.
Miscellaneous center punches, coppering punches, cooper's punches, 3645, various yards.
Miscellaneous taper pin reamers, 3691, Washington.
One swing cut-off saw, 3718, Brunswick, Ga.
Miscellaneous band saws, 3680, various yards.

Schedule numbers, dates of opening and places of delivery follow the specifications of the tools.

HAMMOND, IND.—The Standard Oil Co. is making extensive improvements at its Whiting refinery.

INDIANAPOLIS.—The Indianapolis Forging Co. is taking bids for alterations to its plant.

KOKOMO, IND.—The Haynes Auto Co. plans the erection of a forge shop, one story. The project will mature shortly.

AKRON, O.—The East End Machine Co., 562 Rhodes avenue, plans the erection of a machine shop, 60 x 100 feet, to cost about $15,000.

CINCINNATI.—The Reyburn-Hunter Foy Co., 819 Broadway, is having plans made for the remodeling of its plant.

CINCINNATI.—The Gruen Watch Co. contemplates the erection of an addition to its plant estimated to cost about $60,000 and be 40 x 75 feet.

CLEVELAND.—The Lambert Machine & Engineering Co., 1967 East Fifty-fifth street, plans the erection of a plant addition estimated to cost $30,000.

CLEVELAND.—The Aluminum Castings Co., 2600 Harvard avenue is in the market for two portable cranes.

CLEVELAND.—The Bissinger Magneto Co., Schofield building, has had plans prepared for the erection of a 2-story, 40 x 135-foot plant.

CLEVELAND.—The Sommer & Adams Tool Co., a new incorporation, has taken over the plant of the Permanent Mfg. Co., 2934 East Fifty-fifth street.

CLEVELAND.—Phillips & Bixel, 409 American Trust building, plan to erect a warehouse and machine shop at a cost of about $30,000.

CLEVELAND.—The Champion Machine & Forging Co., 3725 East Seventy-eighth street, has let a contract for the erection of a forge shop, 54 x 160 feet.

CLEVELAND.—The Robinson Mfg. Co., 3123 Brunner avenue, has awarded a contract for the erection of a 1-story, 24 x 86-foot addition, estimated to cost $7000.

CLEVELAND.—The Electrical Mfg. Co., 112 Hamilton avenue, has acquired the old plant of the Richard Auto Mfg. Co., and will remodel the plant for its own use.

CLEVELAND.—The Cleveland Implement Mfg. Co., recently incorporated with $500,000 capital, is to start operations soon in Alliance, O. George H. Burrows, Guardian building and others are interested in the concern.

COLUMBUS, O.—The American Water Motor Co., 108 West Spring street, contemplates the erection of a plant, 1-story, 45 x 90 feet.

FOSTORIA, O.—The Seneca Wire & Mfg. Co. contemplates the installation of additional equipment and will increase the capacity of its plant.

FREMONT, O.—The Crescent Mfg. Co., razor blade manufacturer, is rebuilding its plant recently damaged by fire.

GALION, O.—The Galion Iron Works & Mfg. Co. will increase its capital and the proceeds will be used in enlarging its plant.

GREENVILLE, O.—It is reported that the plant of the Great Eastern Roller Co. may be moved from this city. A. W. Evers and John Wagner recently obtained controlling interest in the company.

HAMILTON, O.—The Long & Alstatter Co. has decided to exercise an option on the plant occupied by a marble company, and according to a report, the plant will be used for the manufacture of agricultural implements.

LORAIN, O.—Improvements are to be made to the plant of the American Shipbuilding Co. here.

MANSFIELD, O.—The Allerding Motor Parts Co. recently obtained permission to change its name to the Allerding Products Co. It will enlarge its plant.

MANSFIELD, O.—The American Steel & Machine Co. contemplates erecting a tool room and office building, 60 x 98 feet, to cost about $50,000.

MANSFIELD, O.—The Martin Steel Products Co. recently was incorporated with $150,000 capital, by William Martin, Albert Martin, Carl Oberlin, Way W. Martin and Royal E. Martin.

MARIETTA, O.—The Liedecker Tool Co. is installing machinery in its new plant here.

MARIETTA, O.—The Bridgeport Machine Co., Augusta, Kans., has acquired the plant of the Under-Reamer Tool Co. and plans to enlarge and equip the plant for its own use.

MEDINA, O.—The Medina-Hoke Tractor Co. is reported to be in the market for machine tools for the manufacture of tractors.

MEDINA, O.—The Henry Miller Foundry Co., 825 Long avenue, Cleveland, will take bids about March 1 for the erection of a large warehouse here.

MILFORD, O.—The Rock county board of supervisors plans the election of a hydro-electric power plant, 104 x 116 feet.

MINGO JUNCTION, O.—The Pennsylvania railroad is having plans drawn for the erection of a pump house here.

NEWARK, O.—The Midland Oil Co. recently was incorporated with $60,000 capital, by D. B. Grubb and others.

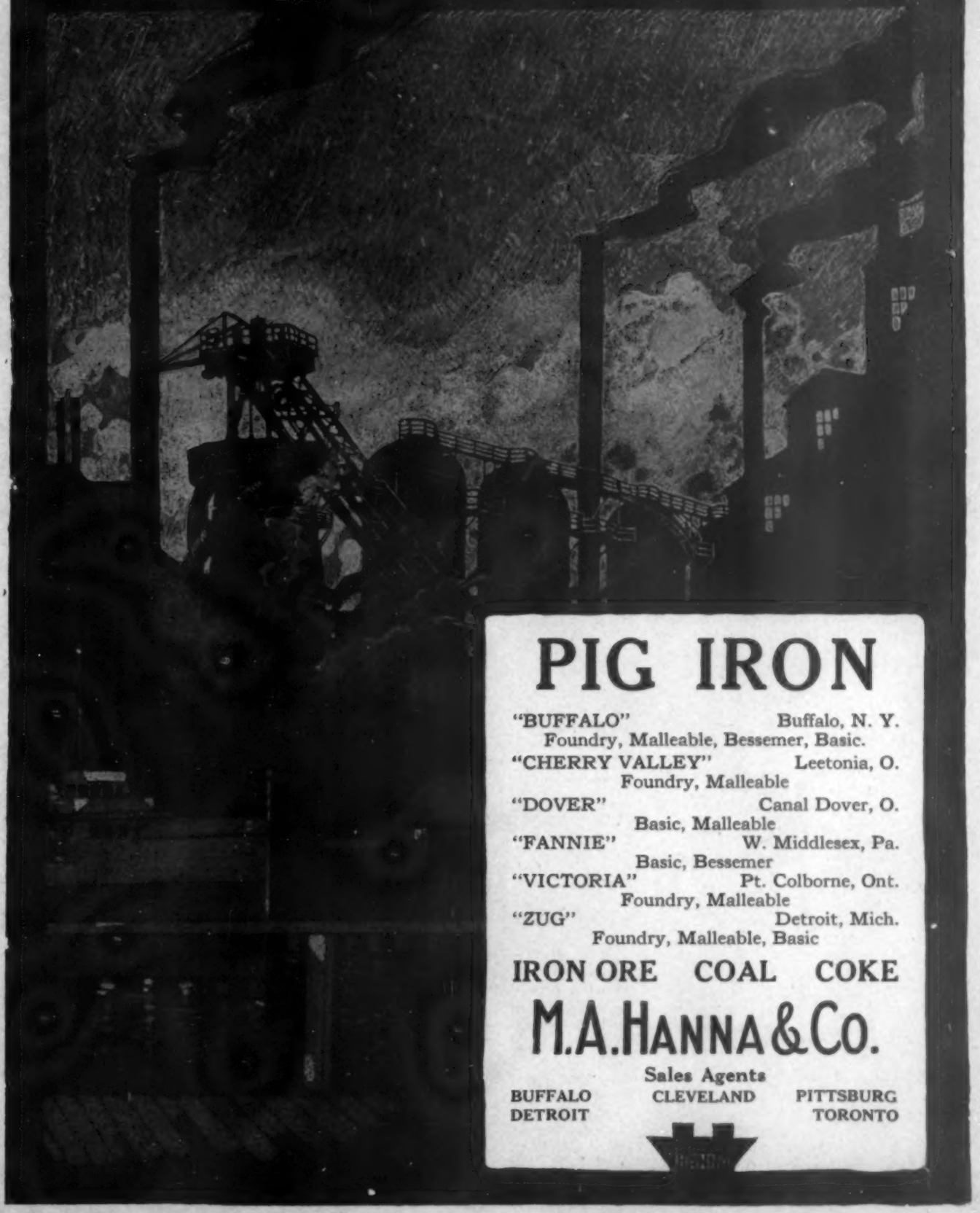
SANDUSKY, O.—The New York Central railroad is ready to go ahead with the construction of car shops here, which are planned some time ago.

SEBRING, O.—It is reported that O. H. Sebring of this city and several Alliance, O., men, are planning to build a sheet steel mill here.

TIFFIN, O.—W. H. Roe of the Hollis Tractor Co. has started preliminary work for the installation of new machinery in the company's plant.

TIFFIN, O.—The Hollis Tractor Co., Pittsburgh,

HANNA



PIG IRON

"BUFFALO" Buffalo, N. Y.
Foundry, Malleable, Bessemer, Basic.

"CHERRY VALLEY" Leetonia, O.
Foundry, Malleable

"DOVER" Canal Dover, O.
Basic, Malleable

"FANNIE" W. Middlesex, Pa.
Basic, Bessemer

"VICTORIA" Pt. Colborne, Ont.
Foundry, Malleable

"ZUG" Detroit, Mich.
Foundry, Malleable, Basic

IRON ORE COAL COKE

M. A. HANNA & CO.

Sales Agents

BUFFALO CLEVELAND PITTSBURG
DETROIT TORONTO

recently purchased the property here of the American Strawboard Co. and will make alterations to the building.

SPRINGFIELD, O.—The city plans the erection of a sewage disposal plant within the near future.

TOLEDO, O.—The Maumee Malleable Castings Co. plans to erect a plant addition.

TOLEDO, O.—The Hardwick Mfg. Co. recently established a plant, including a foundry, for the manufacture of gas and oil heating equipment.

TOLEDO, O.—The Landall Tractor Co. has been incorporated with $10,000 capital, by R. M. Lucky and C. A. Carpenter. A plant will probably be erected here.

VALLEY JUNCTION, O.—The Greenville Gravel Co. contemplates erecting a sand screening plant.

WASHINGTON COURTHOUSE, O.—It is reported that a large company is seeking to obtain property here owned by the Sanderson Cyclone Drill Co., Orville, O., on which to erect a foundry.

WARREN, O.—The Tri-State Foundry & Machine Co., Wellsburg, W. Va., has obtained a site here and plans to erect a foundry and machine shop.

WILMINGTON, O.—The Wilmington Casting Co. is having plans prepared for a pattern storage vault and will be in the market for equipment.

WOOSTER, O.—The Buckeye Aluminum Co. is reported to be planning the erection of a $50,000 plant here.

YOUNGSTOWN, O.—A. O. Potts, 402 Carroll street, is taking bids for the erection of a foundry, 50 x 100 feet.

ASHLAND, KY.—The Thornton Trolley Wheel Co. recently was incorporated to manufacture iron trolley wheels, by P. M. Scott and others.

BOWLING GREEN, KY.—The Universal Machine Co. is completing the erection of a new plant to replace one damaged by fire some time ago.

EARLINGTON, KY.—The Earlington Machine Co., capital $10,000, has been chartered by Amelia Hanna, John Hanna and others.

LOUISVILLE, KY.—The Louisville Steel & Iron Co. has a permit to erect additions to its plant.

LOUISVILLE, KY.—Tuck & Co., 1113 West Main street, will install considerable power plant equipment.

LOUISVILLE, KY.—B. F. Avery & Sons completed plans for additions to its plant. The forge rooms and mechanical departments will be enlarged.

LOUISVILLE, KY.—The Standard Oil Co. of Kentucky is installing a machine shop at its Riverside refinery.

LOUISVILLE, KY.—The Republic Welding Co. has moved its plant and now occupies much larger quarters.

LOUISVILLE, KY.—The Union Machine Co., capital $15,000, has been chartered to conduct a brass foundry, etc., by Ray Buckley, Harry Buckley and M. L. Kannapel.

LOUISVILLE, KY.—Bids will be taken shortly by the C. C. Stoll Oil Co. for boilers, pumps, stills and other equipment for its new refinery which it plans to erect here.

MANCHESTER, KY.—The Columbia-Panama Coal Co., 180 North Dearborn street, Chicago, plans to erect a power house, machine shop and repair sheds.

PADUCAH, KY.—The Prester Knitting Mills Co. will install a machine shop.

PADUCAH, KY.—The Lack Mfg. Co. will install a machine shop for manufacturing internal combustion engines.

BECKLEY, W. VA.—The Virginian Railroad Co. has let the contract for a power plant here.

BENWOOD, W. VA.—The Wheeling Steel & Iron Co. is erecting a 1-story, 50 x 100-foot addition.

BLUEFIELD, W. VA.—The Norfolk and Angle tipple of the Pocahontas Fuel Co. was damaged by fire with a loss of $150,000.

BLUEFIELD, W. VA.—The Eclipse Pocahontas Coal Co. plans to increase its capital and to make improvements and several additions to its plant.

CHARLESTON, W. VA.—The Kanawha & Michigan Railway Co. will make extensive improvements.

CHARLESTOWN, W. VA.—C. E. Howland, Nitro, W. Va., is president of the Fryland Coal Co., which will build a $50,000 plant in Kanawha county, W. Va.

COLCORD, W. VA.—The Mammoth Vein Coal Co., Richmond, Va., recently incorporated with $300,000 capital, plans to develop a coal mine.

ELKINS, W. VA.—The International Coal Products Corp. is constructing a $3,000,000 by-product plant at Kiser, Va.

FAIRMONT, W. VA.—The Monongahela Valley Traction Co. plans to erect a power plant.

FAIRMONT, W. VA.—The Domestic Coke Co. has let the contract to the Koppers Co., Pittsburgh, for 60 ovens.

GRAFTON, W. VA.—The L. D. Vaughn Igniter Co. will build a plant.

MORGANTOWN, W. VA.—The Gustin Coal Co. will build a $50,000 plant in Monongahela county. Address Frank Strickler of Morgantown.

WHEELING, W. VA.—A special railroad siding is to be constructed into the plant of the Standard Iron & Metal Co.

NEW CUMBERLAND, W. VA.—The City Casting Co. recently was taken over by Wheeling interests and the company has increased its capital to carry out plans for enlarging its plant.

Throughout the West

HIBBING, MINN.—The village of Hibbing, D. D. Heley, clerk, is having plans prepared for a power house costing $200,000.

MINNEAPOLIS.—Architect S. J. Bowler, 323 South Fourth street, has plans prepared for a foundry. The name of the owner is withheld.

MINNEAPOLIS.—The Electric Machinery Co., Taylor street and Fourteenth avenue, plans to build a 4-story, 60 x 160-foot addition.

ST. PAUL.—The Modern Pattern Co., 3241 Thirtieth avenue, is having plans made for the erection of a pattern shop, 1-story, 30 x 100 feet.

DUBUQUE, IOWA.—The Liberty Tractor Co., 803 Main street, plans the erection of a plant to cost about $25,000.

KANSAS CITY, MO.—This city is having plans drawn for the erection of a coal pulverizing plant of 200 tons capacity.

KANSAS CITY, MO.—A building occupied by the Midwest Electrical Co., the Midwest Chandelier Co. and the American Plating Works recently was badly damaged by fire.

SPRINGFIELD, MO. — The United Iron Works plans to build a machine shop at an estimated cost of $30,000.

ST. LOUIS.—The iron foundry of the Liberty Foundry Co., Inc., recently was badly damaged by fire.

STUTTGART, ARK.—The Conrey & Ham Machinery Co. has been incorporated with $10,000 capital, by C. D. Conrey, C. R. Ham and A. E. Moran.

BROWNWOOD, TEX.—P. J. McNey, Temple, plans the erection of a foundry and machine shop here at a cost of $40,000.

DALLAS, TEX.—The Wyatt Metal & Boiler Works recently increased its capital from $100,000 to $200,000 and will enlarge its plant.

DALLAS, TEX.—The Dallas Motor Car Co. plans the rebuilding of its plant which was recently damaged by fire.

CLEVELAND, OKLA.—The Murray Tool & Supply Co. has been incorporated with $200,000 capital, by James M. and E. T. Murray, Cleveland, and Claud M. Murray, Yale.

SAND SPRING, OKLA.—The Southwestern Steel Co. will equip a plant for the manufacture of brass and iron castings.

JUNCTION CITY, KANS.—Equipment purchased for the new shop buildings, now being completed for the Union Pacific railroad, when fire damaged the warehouse in which it was stored.

FREMONT, NEB.—It is reported the Nebraska Foundry & Machine Co., Omaha, contemplates erecting a branch plant here.

HAVELOCK, NEB.—The Lincoln Stove Repair Co., 203 South Tenth street, contemplates erecting a foundry here.

SIOUX FALLS, S. D.—The Sioux Falls Metal Culvert Co. and the Dreadnought Co. of Cedar Falls, Iowa, have combined, under the former company's name, and the plant here will be enlarged.

COLORADO SPRINGS, COLO.—The Hassell Iron Works, Moreno and Sierra Madre streets, plans the erection of an addition to its plant at an estimated cost of $50,000.

Business in Canada

KASLO, B. C.—The Gibson Mining Co. will build a concentrator plant at a cost of $25,000. Secretary-treasurer C. D. Empfield is in charge.

NORTH BEND, B. C.—Plans are being prepared for the construction of a coaling plant here for the Canadian Pacific railway to cost about $50,000.

SMITHERS, B. C.—The Canadian Pacific railway will build a power plant and install machinery costing $25,000.

CORNWALL, ONT.—L. F. Hogan, Ltd., has been incorporated to manufacture hardware, machinery, etc., with $30,000 capital, by Joseph A. Primeau, Adam C. Fetterly and James Gardner.

HAMILTON, ONT.—The machine shop of the Canada Steamship Lines recently was damaged by fire. The loss was estimated at $13,000.

NEW HAMBURG, ONT.—The Siemon Tractor Corp. will make alterations and improvements to its plant. J. E. Siemon is manager.

OJIBWAY, ONT.—The Canadian Steel Lands, Ltd., has been incorporated to manufacture iron and to carry on a general mining business with $1,000,000 capital, by Ward B. Perley of the Canadian Steel Corp., William R. Crosett and William Singleton.

OSHAWA, ONT.—F. McCullough will build a 2-story plant here for the manufacture of automobile accessories, at a cost of $60,000.

OTTAWA, ONT.—Robertson-Olsen, Ltd., has been

incorporated to manufacture machinery, etc., with $100,000 capital, by David Robertson, Christopher O. Olsen and George D. Kelley.

PORT CREDIT, ONT.—The Motor Sales & Machinery Co., Ltd., has been incorporated to manufacture motors, etc., with $50,000 capital, by Alfred T. Hill, William R. Hill, Port Credit, and Richard A. Biggs.

ST. CATHARINES, ONT.—Whitman & Barnes, Ltd., manufacturer of drills, wrenches, etc., will build an addition.

TORONTO, ONT. — The Canadian Electric Ore Smelters, Ltd., has been incorporated with $40,000 capital, by R. H. Parmenter and others.

TORONTO, ONT.—The Canadian Cartridge Co., Ltd., has been incorporated to make iron and steel products, with $1,000,000 capital, by R. H. Parmenter, W. S. Morlock and S. P. Fowler.

TORONTO, ONT.—The Veterans' Mfg. & Supply Co., Ltd., has been incorporated to manufacture bicycles, etc., with $40,000 capital, by Lancing B. Campbell, Edward B. Graham and Maxwell Schott.

TORONTO, ONT.—The McAllister Self-making Bed Co. of Canada, Ltd., has been incorporated to manufacture iron beds, etc., with $50,000 capital, by Angus C. Heighington, William J. Dash and Wilfrid Heighington.

WATFORD, ONT.—The Andrews Wire Co. will build an addition to its plant and install machinery.

SWIFT CURRENT, SASK.—W. H. Hodges, 217 Third street, will build a garage and repair shop.

MOOSOMIN, SASK.—The town council plans the installation of an electric light plant to cost about $50,000.

LAKE GEORGE, N. B.—The North American Antimony Smelting Co., Ltd., is completing plans for reopening its mines and smelter in the spring.

ANTIGONISH, N. S.—The town council will rebuild its electric light plant.

SAULNIERVILLE, N. S.—Work will be started on the construction of a shipbuilding plant for the Duffy Blinn Co.

HULL, QUE.—An explosion recently damaged the plant of the Hull Steel & Iron Foundries, Ltd.

MONTREAL, QUE.—The Fyshe & Co., Ltd., has been incorporated to manufacture machinery, generate power, etc., with $50,000 capital, by Errol Languedoc, Colville Sinclair and Ralph E. Allen.

Changes in Names and Locations Announced in the Trade

TO combine the wholesale and retail ends of its business, the Modern Way Furnace Co., Fort Wayne, Ind., has removed its general offices from the seventh floor of the Shoaff building to a location at No. 219 and 221 East Berry street. One room is used for the general offices, taking care of the wholesale department, while the other will be utilized for a salesroom for both retail and wholesale.

* * *

Frank Samuel, Harrison building, Philadelphia, iron, steel and ores, has moved his Massachusetts branch from 11 Ricker road, Newton, Mass., to a new office in the Exchange building, 53 State street, Boston.

* * *

The DePere Mfg. Co., Depere, Wis., has moved its conveying machinery department from Chicago to DePere.

* * *

The Inland Steel Co., Chicago, will open a sales office in the Commerce building, Kansas City, Mo., on Feb. 1.

* * *

The Quigley Furnace Specialties Co., 26 Cortlandt street, New York, recently opened a branch office at 302 Turks Head building, Providence, R. I.

* * *

The Grip Nut Co. has removed its Chicago offices to 943 Peoples Gas building.

* * *

The Guerber Engineering Co., Bethlehem, Pa., has changed its name to Bethlehem Fabricators, Inc., with no change in ownership, direction, management or policy.

* * *

The Carnahan Tin Plate & Sheet Co., Canton, O., has removed its eastern sales office from the Bourse building, Philadelphia, to the Woolworth building, New York.

* * *

The Iowa Culvert & Sheet Metal Co., Muscatine, Ia., has changed its corporate style to the Iowa Sheet Metal Products Co.

* * *

The McCrosky Reamer Co., Meadville, Pa., has changed its name to the McCrosky Tool Corp.

* * *

The Advance Foundry Co., Dayton, O., has removed its office and plants from Crane and Harshman and 1803 East First streets to its new plant, located at Parnell and Florence avenues.

* * *

The Pittsburgh office of the Milwaukee Crane & Mfg. Co., formerly located at 704 Empire building, now is at 2201 Farmers Bank building. Charles M. Sullivan is the district sales manager.

* * *

The offices and shops of the Faget Engineering Co., Inc., San Francisco, have been consolidated and removed to larger quarters from 354 Pine street to 535-545 Howard street, that city. With its expanded facilities it will be better able to take care of its customers' needs in supplies, machines, pipe work, etc.

* * *

The Vanadium-Alloys Steel Co. of Pittsburgh, has opened offices and warerooms at 566 West Randolph street, Chicago.

* * *

The Blackmer Rotary Pump Co. has transferred its general sales office from Petoskey, Mich., to the Book building, Detroit, with J. B. Huycky and J. H. Oldham in charge.

* * *

The Lister Sash Weight Co., St. Louis, has changed its name to the Chemical Foundry Co.

* * *

The partnership of Lindsay Bros., 78 to 94 Reed street, Milwaukee, one of the largest farm implement and machinery concerns in the middle west, has been changed to a corporate style, under the name of Lindsay Bros., steamfitters' supplies.

* * *

The name of the Warman Aluminum Casting Co., Cincinnati, has been changed to the Cincinnati Aluminum Casting Co.

* * *

The Fansteel Products Co., Inc., has removed its office from 2 Columbus Circle to 15 Park Row, New York.

* * *

The Evan L. Reed Mfg. Co., Sterling, Ill., has removed to its new 3-story building and has absorbed the Holmquist-Swanson Co., Chicago.

* * *

The Great Eastern Roller Co., Greenville, O., has changed its name to the New Way Husker Co.

Iron and Steel Prices

Corrected to Tuesday Noon

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports	
Old range Bessemer, 55 iron	$6.65
Mesabi Bessemer, 55 iron	6.40
Old range non-Bess., 51½ iron	5.90
Mesabi non-Bess., 51½ iron	5.75

Warehouse Prices

Steel bars, Chicago	3.97c
Steel bars, Cleveland	3.87c to 4.00c
Steel bars, Detroit	3.93c
Steel bars, Philadelphia	3.95c
Steel bars, New York	3.97c
Steel bars, St. Louis	4.04c
Steel bars, Cincinnati	3.93c
Steel bars, St. Paul	4.195c
Steel bars, Buffalo	3.915c
Iron bars, Buffalo	4.70c
Iron bars, Chicago	4.77c
Iron bars, Detroit	3.93c
Iron bars, St. Louis	4.04c
Iron bars, Cincinnati	3.93c
Iron bars, Philadelphia	4.30c
Iron bars, New York	4.57c
Shapes, Chicago	4.07c
Shapes, Detroit	4.03c
Shapes, St. Louis	4.14c
Shapes, St. Paul	4.295c
Shapes, New York	4.07c
Shapes, Cleveland	4.00c
Shapes, Philadelphia	4.05c
Shapes, Buffalo	4.015c
Shapes, Cincinnati	4.03c
Plates, Buffalo	4.215c
Plates, Chicago	4.27c
Plates, Detroit	4.23c
Plates, St. Louis	4.34c
Plates, St. Paul	4.605c
Plates, New York	4.27c
Plates, Cleveland	4.17c
Plates, Philadelphia	4.25c
Plates, Cincinnati	4.23c
No. 10 blue anl. sheets, Chicago	5.17c
No. 10 blue anl. sheets, Cleveland	5.00c
No. 10 blue anl., Buffalo	5.165c
No. 10 blue anl. sheets, St. L.	5.24c
No. 10 blue anl. sheets, Cincinnati	5.13c
No. 10 blue anl. sheets, St. Paul	5.395c
No. 10 blue anl. sheets, Detroit	5.13c
No. 28 black sheets, Chicago	6.22c
No. 28 black sheets, Cleveland	6.00c
No. 28 black sheets, Cincinnati	6.28c
No. 28 black, Detroit	6.28c
No. 28 black sheets, St. L.	6.29c
No. 28 black sheets, St. Paul	6.445c
No. 28 black Buffalo	6.165c
No. 28 galv. sheets, Chicago	7.57c
No. 28 galv. sheets, Cleveland	7.25c
No. 28 galv. sheets, Cincinnati	7.53c
No. 28 galvanized, Detroit	7.53c
No. 28 galv. sheets, St. L.	7.67c
No. 28 galv. sheets, Buffalo	7.515c

Iron and Steel Scrap

(Prices in Gross Tons)

STEEL WORKS USE

Bundled sheets, Cincinnati	$10.50 to 11.00
Bundled sheets, Pittsburgh	13.00 to 14.00
Bundled sheets, Cleveland	10.00 to 10.50
Bundled sheets, Buffalo	11.50 to 12.00
Boiler plate, cut, No. 1, Chicago	10.00 to 11.00
Boiler plate, cut, No. 1, St. Louis	11.50 to 12.00
Frogs, switches, guards, St. Louis	16.00 to 16.50
Frogs, switches, guards, Chicago	15.00 to 15.50
Heavy melting steel, Pittsburgh	16.00 to 17.00
Heavy melting steel, Buffalo	14.00 to 15.00
Heavy melting steel, Chicago	15.00 to 15.50
Heavy melting steel, Cleveland	14.50 to 15.25
Heavy melting steel, Cincinnati	17.00 to 17.50
Heavy melting steel, east. Pa.	15.00 to 16.00
Heavy melting steel, N. Y. (Deal.)	11.00 to 12.00
Heavy melting steel, St. L.	16.00 to 16.50
Heavy melting steel, Birmingham	13.00 to 14.00
Baled sheets, Cleveland	14.50 to 15.25
Baled sheets, Pittsburgh	14.00 to 15.00
Baled sheets, Chicago	11.50 to 12.00
Knuckles, couplers, Chicago	19.00 to 20.00
Knuckles, couplers, St. Louis	16.00 to 16.50
Low phos. steel, Buffalo	19.00 to 20.00
Low phos. steel, Pittsburgh	25.00
Low phos. crops, eastern Pa.	25.00
Low phos. guaranteed E. Pa.	25.00
Shoveling steel, Chicago	14.50 to 15.00
Shoveling steel, St. Louis	14.50 to 15.00
Steel rails, short, Cleveland	20.00 to 20.50
Steel rails, short, Chicago	17.00 to 17.50
Steel rails, short, St. Louis	16.00 to 16.50
Steel rails, old, Birmingham	14.00 to 16.00
Stove plate, Chicago	18.00 to 18.50
Stove plate, Cincinnati	14.00 to 14.50
Stove plate, St. Louis	11.00 to 11.50
Stove plate, N. J. pts. (Dealers')	17.50 to 18.00
Stove plate, Birmingham	14.00 to 16.00
Stove plate, Buffalo	16.00 to 17.00
Stove plate, eastern Pa.	18.00 to 20.00
Stove plate, Cleveland	14.00 to 15.00
Stove plate, Pittsburgh	15.00 to 16.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:

Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.75
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	4.25
Chicago to:	
Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	24.5 cents
Boston	30.0 cents
Buffalo	21.5 cents
Baltimore	25.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

IRON MILL USE

Busheling, No. 1, Cleveland	15.00 to 16.00
Busheling, No. 1, Buffalo	13.00 to 14.00
Busheling, No. 1, Pittsburgh	17.00 to 18.00
Busheling, No. 1, Cincinnati	16.50 to 17.00
Busheling, No. 1, Chicago	15.50 to 16.00
Busheling, No. 2, Chicago	11.00 to 12.00
Busheling, No. 1, St. Louis	15.00 to 15.50
Cast borings, New York (Dealers')	10.00
Cast borings, eastern Pa.	13.00 to 14.00
Cast borings, Buffalo	11.00 to 12.00
Cast borings, Cleveland	10.25 to 10.75
Cast borings, Cincinnati	8.00 to 9.00
Cast borings, Pittsburgh	12.00 to 13.00
Cast borings, Birmingham	8.00 to 10.00
Cast borings, Chicago	9.50 to 10.50
Cast borings, St. Louis	10.00 to 10.50
City wrought, long, N. Y. (Deal'r)	15.00 to 16.00
Cut forge, Chicago	16.00 to 16.50
Forge No. 1, eastern Pa.	15.00 to 16.00
Forge flashings, large, Cleveland	11.00 to 12.00
Forge flashings, small, Cleveland	15.00 to 15.50
Grate bars, Buffalo	21.00 to 22.00
Grate bars, Cleveland	14.00 to 14.50
Grate bars, N. J. pts. (Deal'rs')	17.50 to 18.00
Iron axles, Pittsburgh	29.00
Iron axles, Cincinnati	26.00 to 27.00
Iron axles, Cleveland	31.00 to 32.00
Iron axles, Chicago	33.00 to 34.00
Iron axles, eastern Pa.	nominal
Iron axles, St. Louis	23.00 to 23.50
Iron axles, Buffalo	23.00 to 24.00
Iron rails, Chicago	22.00 to 23.00
Iron rails, Buffalo	21.00 to 22.00
Iron rails, Cincinnati	21.00 to 22.00
Iron rails, St. Louis	23.00 to 23.50
Iron rails, Cleveland	24.00 to 25.00
Machine turnings, Cincinnati	8.00 to 8.50
Machine turnings, Cleveland	7.75 to 8.25
Machine turnings, Buffalo	7.50 to 8.00
Machine turnings, N. Y. (Dealers')	8.00
Machine turnings, Pittsburgh	9.00 to 10.00
Machine turnings, east. Pa.	11.00 to 12.00
Machine turnings, Birmingham	8.00 to 10.00
Machine turnings, Chicago	6.00 to 6.50
Machine shop turnings, St. Louis	8.00 to 9.00
Pipes and flues, Cleveland	10.00 to 10.50
Pipes and flues, Chicago	13.50 to 14.00
Pipes and flues, St. Louis	12.50 to 13.00
R. R. mach. cast, No. 1, Buffalo	21.00 to 22.00
R. R. wgt. No. 1, Buffalo	27.00 to 28.00
R. R. wrgt. No. 1, east. Pa.	24.00 to 26.00
Railroad wrgt., No. 1, Cincinnati	19.00 to 20.00
Railroad wrgt., No. 1, Cleveland	20.00 to 21.00
R. R. wrought, No. 1, Pittsburgh	21.00 to 22.00
Railroad wrgt., No. 2, Chicago	16.00 to 16.50
Railroad wrought, No. 1, Chicago	17.00 to 17.50
R. R. wrought, No. 1, Birmingham	13.00 to 15.00
No. 1 yard wrought, eastern Pa.	20.00 to 22.00
No. 1 busheling wrgt., east. Pa.	16.00 to 18.00
Sheet wrought, Pittsburgh	21.00 to 22.00
Railroad wrgt., No. 1, St. Louis	18.00 to 18.50
Railroad wrought, No. 2, St. Louis	17.00 to 17.50
Wrought pipe, Buffalo	13.00 to 14.00
Wrought pipe, east. Pa.	18.00 to 20.00
Wrought pipe, ungraded, east. Pa.	12.00 to 13.00

IRON OR STEEL WORKS USE

Axle turnings, Cleveland	$14.00 to 15.00
Axle turnings, Buffalo	13.00 to 14.00
Heavy axle turnings, east. Pa.	nominal
Heavy axle turnings, Pitts.	13.00 to 14.00
Shafting, New York (Dealers')	17.00 to 18.00
Shafting, east. Pa.	27.00 to 29.00
Shafting, St. Louis	20.50 to 21.00
Steel car axles, Birmingham	18.00 to 23.00
Steel car axles, Pittsburgh	29.00
Steel car axles, N. Y. (Dealers')	24.00 to 25.00
Steel car axles, Buffalo	23.00 to 24.00
Steel car axles, Cleveland	31.00 to 32.00
Steel car axles, East. Pa.	nominal
Steel car axles, Chicago	22.00 to 23.00
Steel car axles, St. Louis	21.50 to 22.00

IRON FOUNDRY USE

Car wheels (iron), Pittsburgh	21.00 to 22.00
Car wheels (steel), Pittsburgh	21.00 to 22.00
Car wheels, East. Pa.	nominal
Car wheels, Buffalo	21.00 to 22.00
Car wheels, Chicago	21.00 to 22.00
Car wheels, St. Louis	22.00 to 22.50
Car wheels, Birmingham	16.00 to 17.00
Car wheels, Cleveland	22.00 to 23.00
Tram car wheels, Birmingham	18.00 to 20.00
Cast, No. 1, Birmingham	18.00 to 20.00
Cast, No. 1, cupola, east. Pa.	24.00 to 26.00
Cast, No. 1, Cleveland	21.00 to 22.50
Cast, No. 1, Cincinnati	18.50 to 19.00
Cast, 1, machy., N. Y. (Dealers')	22.00 to 23.00
Cast, 1, heavy, N. Y. (Dealers')	22.00 to 23.00
Cast, No. 1, Chicago	21.00 to 22.00
Cast, No. 1, Pittsburgh	21.00 to 22.00
Cast, No. 1, St. Louis R. R.	20.00 to 20.50
Malleable, Cincinnati	16.00 to 17.00
Malleable, Cleveland	18.00 to 18.50
Malleable, Buffalo	19.00 to 20.00
Malleable, Pittsburgh	18.00 to 19.00
Malleable, East. Pa.	nominal
Malleable, cupola, East. Pa.	nominal
Malleable, railroad, Chicago	16.50 to 17.00
Malleable, agricultural, Chicago	15.00 to 16.00
Malleable, railroad, St. Louis	13.50 to 14.00
Malleable, agricultural, St. Louis	11.00 to 11.50

MISCELLANEOUS USES

Boiler punchings, Chicago	18.00 to 19.00
Reroll. rails, 5 ft. and over, Pitts.	20.00 to 21.00
Reroll. rails 5 ft. and over, Chi.	15.50 to 16.00
Reroll. rails, 5 ft. and over, E. Pa.	20.00 to 21.00
Reroll. rails, 5 ft. and over, St. L.	18.00 to 18.50
Reroll. rails, 5 ft. or over, Cleve.	20.50 to 21.00
Rerolling rails, long, Birmingham	37.50 to 38.50
Locomotive tires, Chicago	20.00 to 21.00
Locomotive tires, St. Louis	16.00 to 16.50